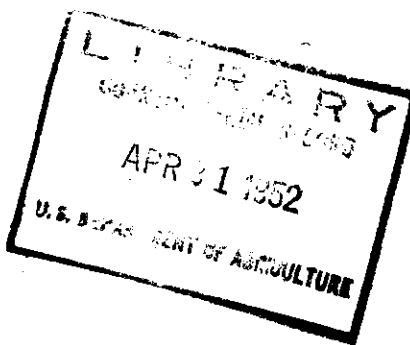


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FOLIC ACID CONTENT OF FOODS

... • microbiological
assay by standardized methods and compilation
of data from the literature



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³FOLIC ACID CONTENT OF FOODS; Microbiological assay by standardized methods and compilation of data from the literature,

by
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SUMMARY

Two types of investigation were carried out to provide information on the folic acid content of foods: (1) A systematic application of standardized microbiological procedures in the laboratory analysis of foods; and (2) a compilation of data and summation of available information from the literature and other sources.

The laboratory procedures for standardized microbiological methods using *Lactobacillus casei* and *Streptococcus faecalis* for assay of folic acid in foods are described in detail in this report.

As a measure of the reliability of these assay methods, exact confidence limits, coefficients of variation, and recoveries of added folic acid were determined. The exact confidence limits were 6.5 percent of the mean for *L. casei* data and 5.6 percent of the mean for *S. faecalis* data and represent errors to be expected from individual assays. The coefficients of variation of the data from repeated assays with standard spinach samples were 10.53 and 8.85 for *L. casei* and *S. faecalis*, respec-

tively, and with standard yeast residuals 8.00 and 12.00, respectively; these represent the reproducibility of the assay over a series of assay periods. On the basis of the amount of folic acid in the food sample and folic acid added as a standard solution, recoveries were 96.9 percent of the total and 92.9 percent of the added folic acid with *L. casei*, and 97.3 percent of the total and 94.8 percent of the added folic acid with *S. faecalis*.

Studies to improve the extraction of samples and/or treatment with enzymes showed that the standardized procedure, extracting at pH 7 and incubating with chicken pancreas, is the most satisfactory of the combinations of conditions and enzymes tested.

Two summary tables on the folic acid content of foods are given. One table contains the detailed results of the above laboratory analysis of market-purchased, locally produced, or special food items; the other, the compiled data from the first table, literature, and other sources.

INTRODUCTION

Extensive reviews on folic acid and related compounds are available. These deal with such various aspects as historical development, isolation, and synthesis (62, 96, 110, 128),¹ nutritional significance (64, 69, 72), clinical uses (1, 33, 73, 74, 95, 122, 129), physiology (32, 40, 82), chemistry (2, 70), biochemistry (3, 71, 125), antagonists for folic acid (63), analytical methods (37, 51, 108), and problems related to assay (105). Some reviewers have also noted briefly references to the literature on the folic acid content of foods and have listed some of the early data (3, 64, 74, 96, 128).

Folic acid has been shown to be identical or related to a number of such factors as: Factor U, necessary for the growth of chicks (109); vitamin B_c (56), a factor in liver extract necessary for chick growth and prevention of the development of anemia; the "L. casei factor," formerly "norite eluate factor" (106), essential for the growth

of *Lactobacillus casei*; the factor necessary for the growth of *Streptococcus lactis* R (86); and vitamin M (35) the antianemia factor for monkeys.

Folic acid is known as pteroylglutamic acid on the basis of its chemical structure, having one molecule of glutamic acid linked to *p*-aminobenzoic acid and a pteridine group. Other compounds contain additional numbers of glutamic acid radicals linked through gamma peptide bonds (16, 88, 93, 94). Naturally occurring compounds of one, three, and seven molecules of glutamic acid are known. The possibility of the existence of other naturally occurring forms is recognized. Simpler compounds not containing glutamic acid, such as pteroic acid and formyl pteroic acid, may occur naturally. These are not biologically active and are active microbiologically only for certain strains of *S. faecalis*. Microbiological methods of assay may differentiate among these folic acid-related compounds, depending in part upon the conditions of extracting food samples.

The bioassay employing the monkey, rat, or

¹ Italic numbers in parentheses refer to Literature Cited, p. 112.

chick (36, 94) measures the total folic acid. In addition to growth tests, some work has been done with various blood-response tests. These methods are useful in studies of biological function of the vitamin and in checking the results of other methods of assay of foods, but are limited for extensive use in routine analyses. The microbiological assay has advantages in application and in economy, and has been widely used. Hydrolysis by enzymes converts the multiple glutamic acid compounds to the monoglutamic acid compounds (13, 14, 68, 80, 116) in which form it is active for both *L. casei* and *S. faecalis*, the organisms used in the microbiological assay for the vitamin.

The Association of Official Agricultural Chemists has adopted as first action (12) a standardized procedure using *S. faecalis*, based on the results from three collaborative studies on the microbiological assay. Results from these studies were compared with results from bioassay. Chemical assays have been developed for the determination of folic acid in purified or highly concentrated materials (48, 57, 79, 119, 121). Although requiring further development and study, chemical methods have been reported recently for the estimation of folic acid in natural products (5, 8).

Proper evaluation of data on foods compiled from various sources depends upon the proper interpretation of the assay methods employed. In an extract of the sample, *S. faecalis* responds mainly to the unconjugated form, and *L. casei* to both the triglutamic acid compound and the unconjugated form. Certain enzymes convert conjugated forms of folic acid to the monoglutamic acid compound utilized by both of the microorganisms mentioned. The extent to which the conjugates may be converted under the conditions of extraction, choice of organism, and the enzyme system used determine the reported folic acid content. Naturally occurring enzymes in some food samples aid the extraction of folic acid and hydrolysis of conjugates. Heating to destroy these enzymes and extraction without further

enzyme treatment probably yields an extract in which "free" folic acid may be determined. The pH of the extracting medium could well determine the amount of monoglutamic and triglutamic acid compounds of folic acid in such an extract. Hence the term "free" folic acid has a rather vague meaning. Free folic acid content may be important for conditions of impaired digestion.

Enzyme activity is an important factor in the determination of total folic acid. In addition to controlled conditions of the extractant, such as pH (14) and temperatures and times of incubation (55), the possible effect of naturally occurring inhibitors (54, 84) on enzyme activity, should also be recognized.

Enzymatic treatment of the samples has been used to obtain extracts containing all the folic acid in forms utilized by micro-organisms, measurable as the "total" folic acid content. To that end, takadiastase and papain of earlier methods of assay have not proved satisfactory. Enzyme preparations of kidney, liver, and pancreas have been used more successfully. Hog kidney and chicken pancreas preparations have had a wider recent application (83, 91). Chicken pancreas preparations have been found to have relatively high activity (30) on conjugates of folic acid and to be subject to less inhibition by other substances than are hog kidney preparations.

Recognition of folic acid as a factor required for growth, reproduction, and prevention of anemia in animals and for treatment of several types of anemia in human beings, pointed to the need for information on the folic acid content of food. Such information would assist in appraising the nutritive value of diets and in estimating probable human requirements. The study reported in this publication was made to summarize present information on folic acid content of foods and to extend this information by systematically applying standardized analytical procedures to a large number of foods.

PART I. LABORATORY ANALYSIS OF FOODS

The laboratory work started with a study of the microbiological methods to standardize the procedures and to determine their reliability and reproducibility. Using fruits and vegetables as they appeared in season on the local retail markets and other foods and related food items obtained on the market or through sources² having available samples of known history, analyses were carried out with standardized microbiological procedures with *Lactobacillus casei* and *Streptococcus faecalis* for total folic acid content and, in most cases, for the free folic acid content. Foods common to the southern and southwestern areas of the United States were analyzed at the laboratories of the Texas Agricultural Experiment Station, using products purchased on the retail market or grown locally. These analyses were carried out following the standardized microbiological procedure for the use of *L. casei* for total folic acid content. Standard reference samples of dried spinach and yeast residuals were exchanged between laboratories of the Bureau of Human Nutrition and Home Economics and of Texas to check on the uniformity of the application of the analytical procedures.

In all cases, the fresh foods were obtained in season in quantities large enough to assure a fair sample of the lots available. The edible portion was prepared and reduced to at least six representative subsamples of approximately 200 gm. each. These were used for assay and storage. Stored foods were sealed in tins and held at -40° C. at the laboratories of the Bureau and at -20° C. at the Texas Agricultural Experiment Station. Dry foods were treated likewise, except that 50-gm. portions were taken as representative subsamples.

Analytical Procedures

Moisture and fat

Moisture was determined on weighed 1- to 10-gram samples of food depending on the expected moisture and fat content, and dried to constant weight in a vacuum oven at 50° C., in aluminum foil moisture dishes. Fat was extracted from weighed dried samples under continuous extraction with ethyl ether in a Soxhlet apparatus for

² Grain Branch of the Production and Marketing Administration and the Bureau of Plant Industry, Soils and Agricultural Engineering, Agricultural Research Administration, United States Department of Agriculture.

18 hours. After the ether was evaporated the fat was dried for 2 hours in the vacuum oven and weighed.

Folic acid

The microbiological assay for folic acid followed the procedure used in the 1948-49 Association of Official Agricultural Chemists collaborative study (44, 45) with minor modifications.

Assay media.—The composition of the assay media for the two test organisms used are shown in table 1. Reagents employed in making media were as follows:

Acid-hydrolyzed casein.—100 gm. of vitamin-free casein were mixed with 500 ml. of constant-boiling HCl (ca. 5 N HCl) and refluxed 8 hours. The HCl was removed from the mixture by distillation under reduced pressure until a thick sirup remained. The sirup was dissolved in distilled water and concentrated again in the same manner. The resulting sirup was redissolved in distilled water, adjusted to pH 3 (indicator paper) with N NaOH, and sufficient water added to bring the volume to approximately 600 ml.; 40 gm. of Darco G-60 were added to the solution, stirred several hours, and then filtered. The treatment was repeated for 1 hour if filtrate did not appear colorless. The pH of filtrate was adjusted to 6.8, and sufficient water was added to bring the volume to 1 liter and stored under toluene at 5° C. Solutions were discarded if yellow after storage.

(1 ml. ≈ 100 mg. of hydrolyzed casein.)

TABLE 1.—Composition of media
for assay of folic acid

Constituent	Amount for 1 liter of double strength medium	
	<i>L. casei</i>	<i>S. faecalis</i>
Acid-hydrolyzed casein	100 ml.	100 ml.
DL tryptophan	20 ml.	20 ml.
Adenine-guanine-uracil	50 ml.	50 ml.
Xanthine	50 ml.	50 ml.
Asparagine	60 ml.	60 ml.
Vitamin mixture	100 ml.	100 ml.
Tween "80"	20 ml.	20 ml.
Salts solution A	10 ml.	
Salts solution B	10 ml.	10 ml.
Dextrose, anhydrous	40 gm.	40 gm.
Sodium acetate · 3H ₂ O	64 gm.	
Sodium citrate · 2H ₂ O		46 gm.
K ₂ HPO ₄		6.2 gm.
Glutathione	5 mg.	5 mg.
L cysteine hydrochloride	500 mg.	500 mg.
Manganese sulfate	20 ml.	20 ml.

Tryptophan solution.—5 gm. of DL tryptophan were dissolved in 15 to 20 ml. of 1 N HCl and sufficient water was added to make 250 ml. Solutions were stored up to one week under toluene at 5° C.

(1 ml. ≈ 10 mg. of L tryptophan.)

Adenine, guanine, uracil solution.—0.2 gm. each of adenine sulfate, guanine hydrochloride, and uracil were dissolved with the aid of heat in 10 ml. of 20-percent HCl, and sufficient distilled water was added to make 1 liter and stored under toluene at 5° C.

(1 ml. ≈ 200 μ g. (micrograms) of each.)

Xanthine solution.—0.4 gm. of xanthine was dissolved in 20 ml. of concentrated NH₄OH with heat. Distilled water was added to make 1 liter and stored under toluene at 5° C.

(1 ml. ≈ 400 μ g. of xanthine.)

Asparagine solution.—10 gm. of L asparagine monohydrate were dissolved in water, diluted to 1 liter and stored under toluene at 5° C.

(1 ml. ≈ 10 mg. of L asparagine monohydrate.)

Acetate buffer, pH 4.5.—18.75 gm. (19.8 ml.) of glacial acetic acid and 38.65 gm. of sodium acetate (CH₃COONa · 3H₂O) were dissolved in distilled water, diluted to 500 ml., and stored at room temperature.

Vitamin-mixture solution.—20 mg. of *p*-aminobenzoic acid, 80 mg. of pyridoxine hydrochloride, 8 mg. of thiamine hydrochloride, 16 mg. of calcium pantothenate, and 16 mg. of nicotinic acid were dissolved in approximately 200 ml. of distilled water. Biotin solution to furnish 400 μ g. of biotin, 20 mg. of riboflavin (dissolved in 200 ml. of 0.02 molar CH₃COOH), and 80 ml. of sodium acetate buffer, pH 4.5 were added. The volume was made to 2 liters with distilled water and stored at 5° C. under toluene in a dark glass-stoppered bottle.

(1 ml. ≈ 10 μ g. of *p*-aminobenzoic acid, 40 μ g. of pyridoxine hydrochloride, 4 μ g. of thiamine hydrochloride, 8 μ g. of calcium pantothenate, 8 μ g. of nicotinic acid, 0.2 μ g. of biotin, and 10 μ g. of riboflavin.)

"Tween" solution.—2.5 gm. of "Tween 80"³ were dissolved in warm water (45° C.), diluted to 500 ml., and stored under toluene at 5° C.

(1 ml. ≈ 5 mg. of Tween.)

Salts solution A.—10 gm. of KH₂PO₄ and 10 gm. of K₂HPO₄ were dissolved in distilled water,

³ Polyoxyethylene sorbitan monooleate, Atlas Powder Co., Wilmington, Del.

diluted to 100 ml., and stored under toluene at room temperature.

(1 ml. ≈ 100 mg. of KH₂PO₄ and 100 mg. of K₂HPO₄.)

Salts solution B.—20 gm. of MgSO₄ · 7H₂O, 1 gm. of NaCl, 1 gm. of FeSO₄ · 7H₂O, and 750 mg. of MnSO₄ · H₂O were dissolved in distilled water; 1 ml. of concentrated HCl was added, diluted to 500 ml., and stored under toluene at room temperature.

(1 ml. ≈ 40 mg. of MgSO₄ · 7H₂O, 2 mg. of NaCl, 2 mg. of FeSO₄ · 7H₂O, and 1.5 mg. of MnSO₄ · H₂O.)

Manganese sulfate solution.—5 gm. MnSO₄ · H₂O were dissolved in distilled water, diluted to 500 ml., and stored at room temperature.

(1 ml. ≈ 10 mg. of MnSO₄ · H₂O.)

Assembling the media.—All liquids were combined and approximately 200 ml. of distilled water added. The solid ingredients were dissolved in the liquid and the pH adjusted to 6.8 with NaOH or HCl. The manganese sulfate solution was then added and final volume was brought to 1 liter with distilled water. The mixture was stored under toluene at 5° C.

Reagents.—Following are the reagents which were required for the assay procedure.

M/5 phosphate buffer, pH 7.2.—27.23 gm. of KH₂PO₄ and 5.60 gm. of NaOH were dissolved in water and diluted to 1 liter. Fresh solution was made each time of assay.

0.9-percent sodium chloride.—9 gm. of NaCl were dissolved in water and diluted to 1 liter. 10-ml. portions were placed in test tubes, plugged with absorbent cotton, and autoclaved 15 minutes at 15 pounds steam pressure.

Bromthymol blue indicator saturated solution.—1 gm. of bromthymol blue was suspended in 16.5 ml. of N/10 NaOH and the volume brought to 250 ml. with distilled water.

Solubilized liver extract.—5 gm. of Bacto liver were suspended in 100 ml. of distilled water. The mixture was held at 50° C. for 1 hour and at 80° C. for 5 minutes, filtered, and the filtrate stored under toluene in a glass-stoppered bottle at 5° C.

Standard folic acid solution.—The purity of standard folic acid used in preparing standard solutions was determined by ultraviolet absorption of solutions in N/10 NaOH at 365 m μ using the E_{1cm}^{1%} value of 199 (9). From the data, the

several lots of folic acid dried in the vacuum oven at 100° C. for several hours were 94.0-, 96.8-, 97.8-, and 100-percent folic acid. To prepare standard solutions, a weighed quantity of approximately 10 mg. of standard folic acid was dissolved in and made up to 1 liter volume with 0.01 N NaOH made up in 20-percent alcohol. This stock solution was kept in a dark glass-stoppered bottle at 5° C.; the unused portion was discarded after 6 months. A second stock solution containing exactly 250 millimicrograms of folic acid per ml. was prepared from the original solution by diluting a calculated volume, taking into account the concentration of the first solution corrected for purity of the standard, with 0.01 N NaOH in 20-percent alcohol. This solution was stored under identical conditions and the unused portion discarded after 2 months. Fresh solutions for each determination were made from the second stock in distilled water to contain 10.0, 1.0, and 0.20 millimicrograms of folic acid per ml.

Additional materials.—Additional materials needed for the assays were prepared as follows:

Enzymes.—For the chicken pancreas enzyme preparation, fresh chicken pancreas was ground in the Waring blender with acetone, and the suspended material rinsed into a flask with acetone. The volume of acetone used amounted to five times the weight of the fresh pancreas. The mixture was placed in the refrigerator overnight. The fine material was squeezed through cheesecloth, filtered, washed with acetone, and air-dried. The dry material was ground in a Wiley mill through a 60-mesh sieve and stored at 0° C.

Test organisms.—The test organisms used for the assays were a culture of *Lactobacillus casei* known to be sensitive to folic acid and a culture of *Streptococcus faecalis* R (ATCC 8043).⁴ A culture of *L. casei* (ATCC 7469) did not give regular growth responses to increments of folic acid.

Culture media.—Agar culture media for maintenance of the cultures were prepared as follows: For *L. casei*, 1.5 gm. of Bacto beef extract, 0.5 gm. of Bacto yeast extract, 2.5 gm. of Bacto peptone, 1.25 gm. of Bacto tryptone, 0.5 gm. of dextrose, 7.5 gm. of agar, and 5 gm. of sodium ace-

tate · 3H₂O were made up to 500 ml. of solution with distilled water; for *S. faecalis*, 5 gm. of Bacto tryptone, 5 gm. of Bacto peptonized milk, 6 gm. of agar, and 100 ml. of filtered commercially canned tomato juice were made up to 500 ml. of solution with distilled water. The agar medium was steamed for about 10 minutes to dissolve the agar, tubed in 10-ml. amounts, plugged with absorbent cotton, and sterilized at 15 pounds steam pressure for 15 minutes. Twenty-four hour stabs of *L. casei* and *S. faecalis* subcultured from 24-hour broth cultures, incubated at 37° and 30° C., respectively, were stored in the refrigerator as stock cultures. These stock cultures were prepared every 2 weeks.

Broth culture media tubes were prepared with 5 ml. of the assay medium (table 1), 5 ml. of distilled water, plus 1 drop of solubilized liver extract, plugged with absorbent cotton and sterilized at 15 pounds steam pressure for 15 minutes. Cells were transferred from stock cultures to the broth medium and incubated 18 hours at 37° and 30° C. for *L. casei* and *S. faecalis*, respectively. Cells for use as the inoculum were grown in broth media twice on successive days. To prepare the inoculum the prepared broth media tubes were centrifuged to throw down the cells and the liquid decanted. The cells were resuspended in 10 ml. of 0.9-percent sterile salt solution, the tubes were re-centrifuged, and this washing operation was repeated. The cells suspended in 10 ml. of 0.9-percent sterile salt solution for a third time were used for inoculum.

Food sampling.—For all foods, both fresh and dry, each weighed portion for total folic acid assay was withdrawn from a separate subsample. For assay, the entire fresh subsample, unthawed if frozen, was ground three times through a food grinder. The entire dry subsample of food was ground in a Wiley mill through a 60-mesh sieve, unless the properties of the material made it more desirable to use a sieve permitting larger particle size. The quantity of food used for assay depended both on the estimated folic acid content and the homogeneity of the sample. In the interest of better sampling, at least 1 gm. of dry material or 10 gm. of fresh material were taken.

Assay procedure.—Although the laboratory was not dark, and incandescent lights were permitted, the samples and solutions were not exposed to direct light.

A preliminary run was often used to find the range in which to determine the folic acid content.

⁴ *L. casei* obtained from Laura M. Flynn, Assistant Professor, Department of Agricultural Chemistry, University of Missouri, and Associate Referee on folic acid for the Association of Official Agricultural Chemists Collaborative Studies. *S. faecalis* obtained from the American Type Culture Collection, Washington, D. C.

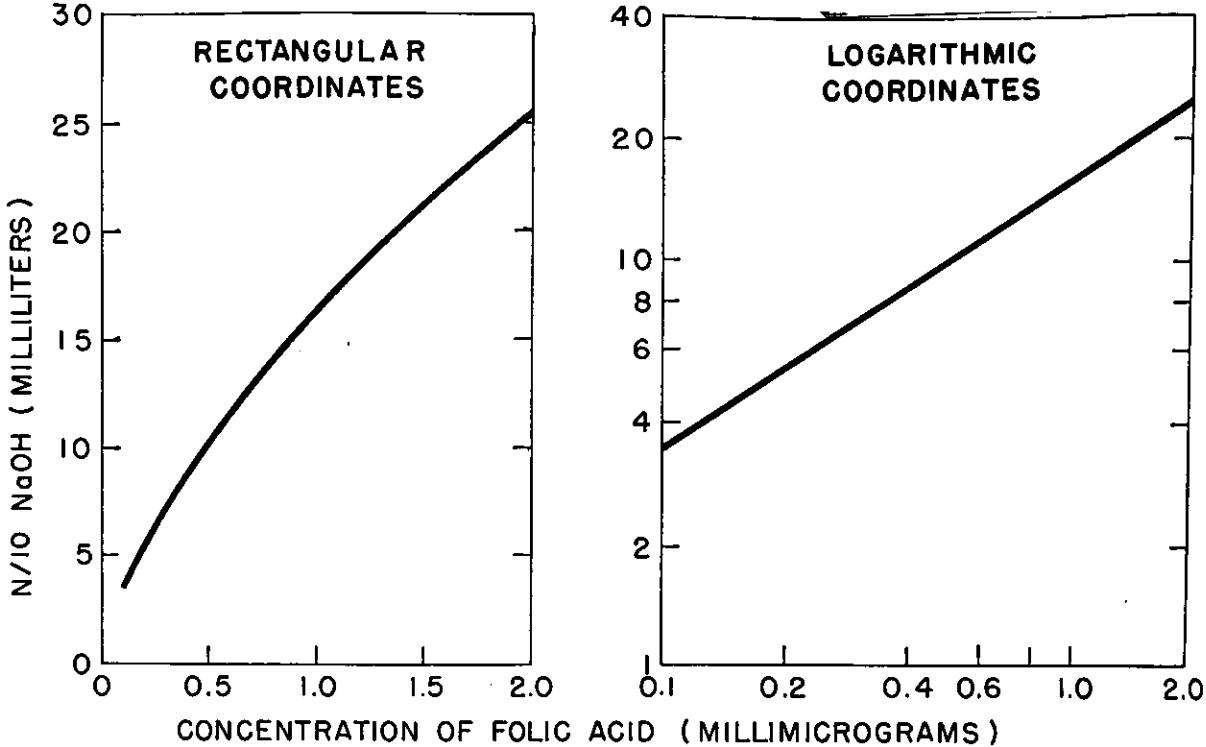


FIGURE 1.—Standard growth curves for *L. casei*.

Three samples of food were weighed, two to be treated with the enzyme preparation for total folic acid and one untreated for the free folic acid. A blank for the enzyme and a reference sample were included in every assay or group of assays. In Bureau of Human Nutrition and Home Economics laboratories a quantity of ground, dried spinach was prepared and stored in the refrigerator for use with each assay as a reference sample; at Texas, yeast residuals was used as the reference sample.

The weighed sample was transferred to the blender containing 40 ml. of M/5 phosphate buffer pH 7.2, approximately 35 ml. of water were added, and the mixture was blended for 3 minutes. The suspended material was rinsed quantitatively into a 500-ml. wide-mouth Erlenmeyer flask using approximately 100 ml. of water but keeping the total volume under 200 ml. Several drops of caprylic alcohol were added to prevent foaming, and the mixture was autoclaved for 15 minutes at 15 pounds steam pressure. When the mixture was cool, 20 mg. of chicken pancreas enzyme preparation, first wet with a drop or so of glycerol and suspended in 5 ml. of water, were added.

Larger amounts of the enzyme were used for material high in folic acid content, such as liver or yeast—100 mg. of enzyme per gram of ma-

terial, dry weight. The enzyme was omitted at this point if free folic acid was being assayed. After adding a few milliliters of toluene the mixture was incubated for 24 hours at 37° C. After incubation the flasks and contents were autoclaved briefly, 5 minutes at 15 pounds. After the mixture was cooled, the volume was brought to 250 ml. in a volumetric flask, mixed, and filtered through a dry filter paper. Aliquots of the filtrate were diluted to the desired concentration such that for *L. casei* there would be 0.2 to 0.5 millimicrograms of folic acid per ml., and, for *S. faecalis*, 0.5 to 2.0 millimicrograms of folic acid per ml.

For the *L. casei* procedure, 13 levels in triplicate were used to establish the growth response to increasing amounts of standard folic acid and 5 levels in triplicate for the sample. Culture tubes with plastic screw tops were used. For the standard curve, 0.0, 0.0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0, 1.0, 2.0, and 3.0 millimicrograms of standard folic acid were placed in successive test tubes by pipetting the appropriate standard solutions. Distilled water was added by pipette to bring the volume to 5 ml., and 5 ml. of the assay medium were added by pipette. For the sample, 1 to 5 ml. of the sample solution of the proper dilution were added to successive test tubes, the volume brought

to 5 ml. with distilled water, and 5 ml. of the assay medium were added. If a pipetting machine was used, the tubes did not need to be agitated for mixing.

The tubes were autoclaved 10 minutes at 15 pounds steam pressure. When cool, they were inoculated aseptically with 1 drop of the inoculum in each tube. In the series of tubes for the standard curve, the first tube was not inoculated and was used as a check on the second tube to show that little or no growth had occurred. Tubes were incubated for 72 hours in a water bath regulated at 37° C. The growth response was determined by titrating the lactic acid produced with N/10 standard NaOH, using 3 drops of bromthymol blue indicator solution.

For *S. faecalis*, the procedure was essentially the same, except that 12 tubes were used in triplicate for the standard curve. 0.0, 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 5.0, and 10.0 millimicrograms of standard folic acid were placed in successive test tubes. Incubation of the tubes was for 72 hours at 30° C., and the titration used 6 drops of bromthymol blue indicator solution.

Standardization of Growth Curves

It was established that the rate of lactic acid production had become very small at the end of 72 hours of incubation. Plotted on log-log coordinate paper (fig. 1) the *L. casei* data showed a linear relationship between the concentrations of N/10 NaOH and folic acid or sample. Since the slopes of the standard and sample curves were found to be very nearly the same, the amount of folic acid in the samples was easily calculated from values read near the means of the standard and sample curves. It has been found to be good practice to have at least three points of the sample curve in the range of 0.2 to 1.0 millimicrograms of folic acid in order to establish the sample curve. Outside of this range, the results would be considered preliminary and useful only for estimating correct dilutions to be made for another assay.

Linear relationships for *S. faecalis* data were not easily obtained. The data may be plotted on rectangular coordinate paper to give sigmoid curves from which the folic acid content of the sample may be determined, preferably at points

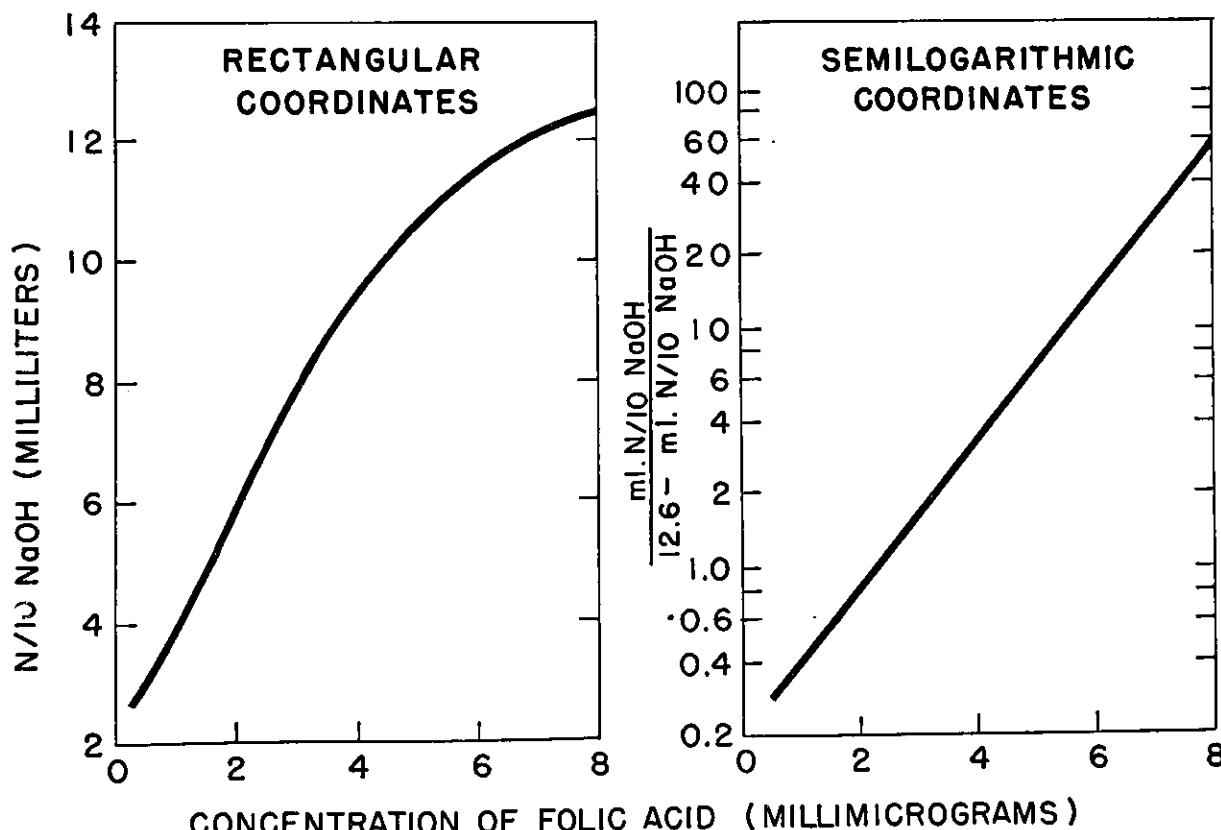


FIGURE 2.—Standard growth curves for *S. faecalis*.

in the range of 1.0 to 5.0 millimicrograms of folic acid. The data of *S. faecalis* were found to be similar to that of an autocatalytic monomolecular reaction (19). From the data of 12 standard curves it was found that $\log(Y/(12.6 - Y)) = a + bX$ was linear (fig. 2, p. 7). The value of the constant 12.6 represented the estimated average maximum titration with N/10 NaOH; a and b , the customary designations of linear equation constants for the intercept and slope, respectively. Y represented the titrations with N/10 NaOH for corresponding values of X , the concentrations of folic acid. The values for $Y/(12.6 - Y)$ and the corresponding logarithms of $Y/(12.6 - Y)$ were tabulated to facilitate the plotting and calculating of data. Thus plotting of $Y(12.6 - Y)$ against X on semilogarithmic paper gave straight lines.

Since concentration values of the standard folic acid and of the sample were plotted on arithmetic scale for the *S. faecalis* data, the standard and sample lines were not necessarily parallel as were the lines derived from *L. casei* data. Coding of the X values for data from samples analyzed with *S. faecalis* was easily done by inspection, using whole numbers to multiply or divide. (As shown in the example on calculations, table 2, the X values were divided by 2 in order to obtain values of approximately the same order of magnitude for the slopes of the curves.) Whether the values of X were coded or not, this method of obtaining linearly related data has avoided the errors encountered in trying to fit the curved lines to data plotted on rectangular coordinates. At least three points of the sample should fall within the range of 1.0 to 5.0 millimicrograms of folic acid to estab-

lish the sample curve, otherwise the data were considered preliminary and used to estimate correct dilutions to be made for another run. The amount of folic acid in the sample was calculated from the values read near the means of the standard and sample curves.

Calculation of Confidence Limits

Errors of the microbiological method have been calculated, using the method described by Bliss (15) to determine the limits of the data which would include the true value for the particular assay being investigated. Calculations of these limits required linear relationships, which was one of the reasons for establishing such a relationship for the *S. faecalis* data.

The equation establishing the straight line and the exact confidence limits as two hyperbolae was given as:

$$X_L = \bar{X} + C^2(Y - \bar{Y})b \\ \pm t(s/b)C \sqrt{1/N + (Y - \bar{Y})^2/(B^2 - s^2t^2)}$$

In order that confidence limits for both the standard and the sample curves would be accounted for, the following equation was given:

$$X_L = \bar{X}_s - \bar{X}_u - C^2(\bar{Y}_s - \bar{Y}_u)/b_c \\ \pm t(s/b)C \sqrt{1/N_s + 1/N_u + (\bar{Y}_s - \bar{Y}_u)^2/(B^2 - s^2t^2)}$$

The terms used are:

X = folic acid concentrations in millimicrograms
for the standard curve; concentration of
the sample in milligrams for the sample
curve. For *L. casei* data these were loga-
rithms.

TABLE 2.—Example of calculation of confidence limits of assays

Terms	<i>L. casei</i>			<i>S. faecalis</i>								
	Standard	Sample	Combined	Standard	Sample	Combined						
N	26	14	40	18	15	33						
\bar{X}	-0.3122	0.4815		2.3889	4.5							
\bar{Y}	.7918	.9307		.1628	.1766							
Sx^2	3.457997	.876914		38.277778	67.50							
Sy^2	1.161560	.455143		1.527819	4.064338							
Sxy	1.984029	.629540		7.5424	16.5105							
b	.5738	.7179		.6029	.1970							
B^2	1.138436	.451947		1.575721	1.485853							
s	.03104	.01632		.03283	.05122							
$t (P=0.30)$	1.059	1.083		1.051	1.071							
C	1.0005	1.0005		1.0035	1.0010							
X_L	$-0.3122 - 0.4815 + 0.2304 \pm 0.0190 = -0.5633 \pm 0.0190$			$2.3889 - 4.5 + 0.0607 \pm 0.1021 = 2.4496 - 4.5 \pm 0.1021$								
Calculation: antilog $-0.5633 = 0.2733$												
$\mu\text{g. folic acid/gm.} = 0.2733$ limits ± 0.0123												
$\mu\text{g. folic acid/gm.} = 0.2722$ limits ± 0.0113												

Y = logarithms of the titrations with N/10 NaOH for *L. casei* data; logarithms of $Y/(12.6 - Y)$ for *S. faecalis* data.

x, y = deviations from X and Y .

$b = S_{xy}/S_y^2$ for slope of single regression line.

$S^2 = (S_y^2 - (S_{xy})^2/S_x^2)/N - 2$ for error variance.

t = value of t from a table of "Student's" distribution (42).

$B^2 = (S_{xy})^2/S_x^2$ measures variation in Y accounted for by slope of regression line.

$C^2 = B^2/(B^2 - s^2 t^2)$ correction term for discrepancy between approximate and exact limits of confidence interval.

N = number of pairs of observations.

Subscripts refer to standard (s), sample or unknown (u), combined slopes of standard and sample curves (c).

An example of experimental data and of calculated values applied to the items in the equations is given in table 2 and illustrated in figure 3. The values of t , arbitrarily chosen at $P = 0.3$ given in the tables, were somewhat higher than values of t for $P = 0.3174$ where the percentage of nor-

mally distributed data would have been equivalent to one standard deviation from the mean. Hence the confidence limits, as calculated, were approximately one standard deviation from the mean. In the example, the percentage deviation from the mean value of *L. casei* data was 4.50; and from the mean value of *S. faecalis* data was 4.15.

The error term expressed in this way showed only the error to be expected from single assays and may be considered as a measure of the precision of procedures and techniques employed. In order to apply these calculations to a number of different foods, data were chosen from analyses of identical food samples assayed by *L. casei* and *S. faecalis* procedures. These summary data are shown in table 3 representing 55 assays among 26 different foods. In order to make a common basis for comparison, the limits were expressed in percent of the mean, which gave approximately the coefficient of variation. The difference between the mean error terms expressed in this way, 6.5 for the *L. casei* and 5.6 for the *S. faecalis* procedures, was not significant.

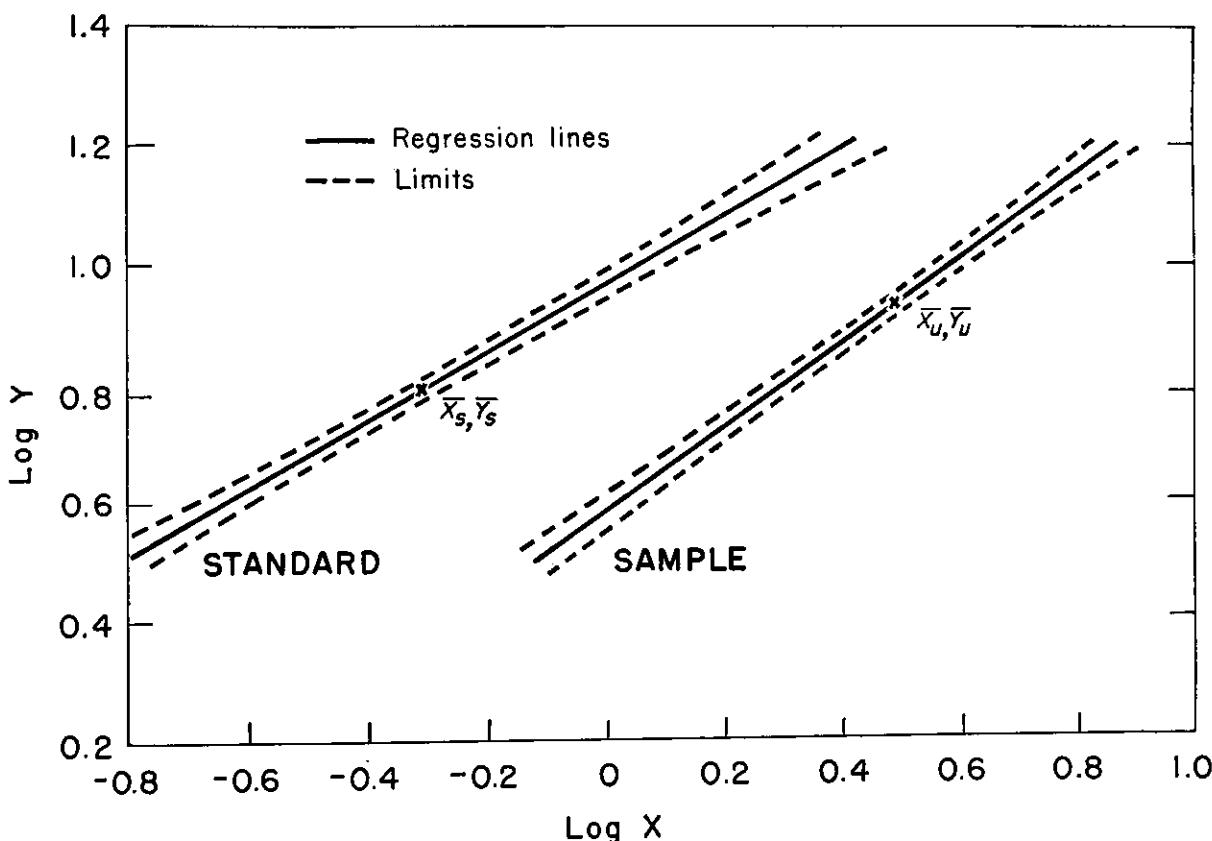


FIGURE 3.—Calculated confidence limits of *L. casei* data for standard and sample curves.

TABLE 3.—*Confidence limits of folic acid values by L. casei and S. faecalis procedures*

Sample	<i>L. casei</i>			<i>S. faecalis</i>		
	Mean	Confidence limits \pm	$CL \times 100/M$	Mean	Confidence limits \pm	$CL \times 100/M$
Beans, green	.0255	.0011	4.3	.0238	.0010	4.2
Beef	.0624	.0023	3.7	.0679	.0040	5.9
Beet greens	.315	.025	7.9	.505	.018	3.6
Brussels sprouts	.163	.008	4.9	.162	.015	9.2
Celery	.0665	.0059	8.9	.0715	.0027	3.8
Grapefruit	.0256	.0023	9.0	.0276	.0012	4.3
Hamburg	.0375	.0013	3.5	.0506	.0027	5.3
Honeydew melon	.0482	.0034	7.0	.0435	.0020	4.6
Kale	.464	.040	8.6	.411	.015	3.6
Lemon	.0454	.0044	9.7	.0397	.0025	6.3
Lime	.0439	.0031	7.1	.0390	.0034	8.7
Orange	.0572	.0044	7.7	.0425	.0035	8.2
Peach	.0199	.0010	5.0	.0215	.0008	3.7
Pear	.0276	.0027	9.8	.0319	.0010	3.1
Pineapple	.0183	.0020	10.9	.0167	.0010	6.0
Radish	.0419	.0028	6.7	.0385	.0037	9.6
Sausage	.0620	.0028	4.5	.0451	.0020	4.4
Soy flour	3.58	.13	3.6	3.98	.18	4.5
Squash	.0932	.0057	6.1	.122	.005	4.1
Strawberry	.0394	.0019	4.8	.0425	.0026	6.1
Sweet corn	.184	.009	4.9	.138	.005	3.6
Tangerine	.0619	.0075	12.1	.0480	.0013	2.7
Tomato	.0909	.0036	4.0	.0770	.0071	9.2
Turnip	.0332	.0012	3.6	.0381	.0024	6.3
Turnip greens	.529	.036	6.8	.472	.045	9.5
Veal	.0268	.0008	3.0	.0396	.0022	5.6

TABLE 4.—*Coefficient of variation of folic acid values by L. casei and S. faecalis procedures*

Sample	Folic acid content		Sample	Folic acid content	
	<i>L. casei</i>	<i>S. faecalis</i>		<i>L. casei</i>	<i>S. faecalis</i>
Spinach	$\mu g./gm.$	$\mu g./gm.$	Yeast residuals	$\mu g./gm.$	$\mu g./gm.$
	9.6	10.3		9.50	7.40
	10.3	10.5		8.75	7.92
	10.0	10.5		9.50	7.40
	9.6	10.0		9.38	7.50
	9.4	10.0		7.95	9.25
	11.0	11.1		8.40	10.02
	10.8	10.0		8.40	9.35
	10.0	10.8		7.70	10.02
	9.4	10.0		8.90	8.84
	8.6	8.4		7.80	9.00
	12.6	10.0			
Mean	10.12	10.14	Mean	8.63	8.67
Standard deviation	1.066	.694	Standard deviation	.690	1.040
Standard error mean	.321	.209	Standard error mean	.218	.329
Coefficient of variation	10.53	6.85	Coefficient of variation	8.00	12.00

TABLE 5.—*Recovery of folic acid added to 1-gm. samples of dried spinach*

Organism	Folic acid in sample	Added folic acid	Number of samples	Calculated total folic acid	Found folic acid	Recoveries	
						Total	Added
<i>L. casei</i>	$\mu\text{ g./gm.}$ $10.31 \pm 0.40^*$	$\mu\text{ g./gm.}$ 5.00 10.00 15.00	5 5 5	$\mu\text{ g./gm.}$ 15.31 20.31 25.31	$\mu\text{ g./gm.}$ $14.82 \pm 0.22^*$ 19.66 ± 0.29 24.55 ± 0.35	Percent	Percent
						96.8	90.2
						96.8	93.5
<i>S. faecalis</i>	12.16 ± 0.72	$\mu\text{ g./gm.}$ 5.00 10.00 15.00	4 4 4	$\mu\text{ g./gm.}$ 17.16 22.16 27.16	$\mu\text{ g./gm.}$ 17.25 ± 1.28 21.06 ± 1.68 26.20 ± 2.64	100.5	101.8
						95.0	89.0
						96.5	93.6

* Standard error of the mean.

Reproducibility of Assays

In addition to variations within replicates made at one time, additional variation is encountered when the assay is repeated on portions withdrawn from the same sample at different times. The net amount of this variation was indicated by the results of analyses on two standard food samples used for control. The data from the assays of these standard samples may be considered a measure of the over-all variability due to differences in sampling, extraction, laboratory techniques, the uncontrolled differences in composition of media, and other factors not easily controlled in this type of assay.

Data given in table 4 show that equivalent mean values were obtained by both *L. casei* or *S. faecalis* procedures for the folic acid content of a standard dried spinach sample and of a yeast residuals sample. However, the coefficients of variation differed with the test organism used. For spinach and yeast residuals, the coefficients were, respectively, 10.53 and 8.00 for the *L. casei* procedure, and 6.85 and 12.00 for the *S. faecalis* procedure.

Recovery of Added Folic Acid

Recoveries of folic acid from samples to which known amounts were added were determined to show the reproducibility of the assay procedures. Standard folic acid was added directly to 1-gm. dry spinach samples before extraction so that the recovery figure should be representative of the effect of the uncontrolled variables for the entire procedure. The results (table 5) showed very good recoveries with both organisms but a greater variation with the *S. faecalis* procedure. The average recovery in terms of total folic acid with *L. casei* was 96.9 percent, range 96.8–97.0; with *S. faecalis*, 97.3 percent, range 95.0–100.5. The average recovery in terms of added folic acid was 92.9 per-

cent with *L. casei*, range 90.2–94.9; with *S. faecalis*, 94.8 percent, range 89.0–101.8.

Potential Enzyme Activity of Chicken Pancreas

In an experiment to determine the relative potency of the chicken pancreas enzyme, varying amounts of the enzyme preparation were added to 1-gm. samples of dried spinach, for the usual extraction procedure. The extracts were assayed by both the *L. casei* and *S. faecalis* methods. The results (table 6) showed that 20 mg. of the enzyme preparation were approximately four times the amount required under the conditions imposed by the standardized extraction procedure. In terms of relative potency, 1 mg. of the enzyme preparation was required to liberate 4.7 $\mu\text{g.}$ of bound folic acid in dried spinach. Up to 320 mg. of the chicken pancreas enzyme preparation have been used with 1-gm. dried spinach samples without increasing the amount of folic acid liberated by 5 mg.

TABLE 6.—*Folic acid liberated by varying amounts of chicken pancreas enzyme from 1-gm. samples of dried spinach*

Enzyme	Folic acid			
	<i>L. casei</i>		<i>S. faecalis</i>	
	Found	Liberated	Found	Liberated
mg.	$\mu\text{g.}$	$\mu\text{g.}$	$\mu\text{g.}$	$\mu\text{g.}$
0	4.10	0	3.75	0
0.005	4.10	0	4.25	.50
0.025	4.10	0	4.50	.75
0.05	4.10	0	4.75	1.00
0.25	5.55	1.45	5.45	1.70
0.50	6.45	2.35	6.50	2.75
1.0	8.80	4.70	8.45	4.70
5.0	10.50	6.40	10.10	6.35
20.0	10.50	6.40	9.95	6.20
100.0	10.50	6.40	10.25	6.50

Completeness of Extraction

Takadiastase, hog kidney, and chicken pancreas enzymes have been used in a study on the extraction of folic acid from food samples. Papain had been reported to be of lesser value for the release of folic acid from tissues (24). Extraction studies on selected foods such as milk, eggs, spinach, turnip greens, and whole wheat confirmed that observation. Takadiastase was a commercial preparation used at a standard or customary level of 20 mg. to 1 gm. of dry-weight sample in acetate buffer at pH 4.5 and incubated at 37° C. for 24 hours. Hog kidney enzyme was prepared by the procedure given by Bird and others (13). Five milliliters of the hog kidney preparation, equivalent to 1.25 gm. of fresh hog kidney, was kept in test tubes stored at -18° C. An amount equivalent to 1.25 gm. of fresh hog kidney was used per gm. of dry-weight sample in acetate buffer at pH 4.5 and incubated at 45° C. for 16 hours. The previously described chicken pancreas enzyme preparation was used at 20 mg. per gm. of dry-weight sample in phosphate buffer at pH 7.2 and incubated at 37° C. for 24 hours.

The techniques of the extraction were those previously described, and the extracts were assayed using the *S. faecalis* procedure. Blanks were run to account for folic acid or the equivalent in the enzyme preparations and reagents. The results of the assays on a number of different food samples (table 7) showed that the chicken pancreas enzyme was very effective. The takadiastase preparation, under the conditions and amounts employed, was of little value for increasing the amount of folic acid over that found in the free form. The hog kidney preparation did increase the amount of folic acid, but in most cases the

TABLE 7.—Effectiveness of different enzymes in releasing folic acid from food samples

Sample	Folic acid content			
	No enzyme	Takadiastase	Hog kidney	Chicken pancreas
Asparagus.....	.016	.017	.025	
Brewer's yeast.....	1.59	-----	15.5	20.9
Egg yolk, dried.....	.38	-----	.28	.58
Mustard greens, dried.....	1.28	-----	4.93	10.47
Onions, spring.....	.090	.110	.090	.249
Radishes.....	.054	.074	.085	.164
Rhubarb.....	.019	.022	.050	.091
Soy flour.....	1.18	-----	1.65	3.86
Strawberries.....	.038	.047	.088	.085

increase was considerably less than that of the chicken pancreas preparation.

In subsequent tests, it was found that approximately eight times the amount of hog kidney preparation (equivalent to 10 gm. of fresh hog kidney) was required to liberate the bound folic acid in 1 gm. of soy flour to the same extent as was liberated by 20 mg. of chicken pancreas preparation. Another hog kidney preparation prepared in the same way confirmed this finding.

In order to test the effectiveness of the extraction procedure, 1-gm. dried spinach samples were treated with buffer solutions varying in pH; autoclaved and not autoclaved; and filtered and not filtered at pH 7.0. It was thought that these unfiltered or suspended samples would show, during the 72-hour incubation period used for the lactic acid production of the growth organisms, whether more folic acid could be removed or whether there would be appreciable interference when the filtrates were not clear. For pH 5.0, acetate buffer (pH 4.5) was mixed with phosphoric acid and the pH brought to 5.0 with NaOH; for pH 7.0 the M/5 phosphate buffer was adjusted to pH 7.0 with phosphoric acid; for pH 9.0, 11.0, and 13.0, N/100,000, N/1000, and N/10 NaOH solutions were used.

The standardized procedure for the preparation of extracts was followed except that samples were rinsed from the blender with appropriate buffer solution rather than with distilled water, and autoclaving for 15 minutes at 15 pounds steam pressure was omitted for samples specified not to be heated during the extraction. Chicken pancreas enzyme was added to samples after cooling, if total folic acid was to be determined. Samples were incubated 24 hours at 37° C. with or without the enzyme, both at the pH of the extracting solutions and after adjustment of the pH to 7.0, using sodium hydroxide or phosphoric acid as required. The amounts of phosphate were accounted for so that there should be slight deviation from the amounts used in the standard procedure.

Samples were autoclaved briefly following incubation with the enzyme. The pH was adjusted to 7.0, if necessary, and the mixture was made to volume in the regular way and filtered, except those samples designated to be suspended. Dilutions were made for the proper level of expected folic acid concentration and assays were made with procedures for either organism or both, according to the convenience of the laboratory schedule.

TABLE 8.—*Mean free and total folic acid in 1-gm. samples of dried spinach subjected to different extracting conditions*

pH	Auto-claved	Assay material	Number of samples	Folic acid	
				Free	Total
5.0	Minutes 15	Clear filtrate	4	μg./gm. 8.7	μg./gm. 11.5
5.0	0	do	7		
7.0	15	do	4	10.9	11.6
7.0	15		5		
7.0	15	Suspended sample	6	4.6	10.8
7.0	15		14		
7.0	0	Clear filtrate	2	6.2	10.3
7.0	0		8		
7.0	0	Suspended sample	4	9.0	11.5
7.0	0		6		
9.0	15	Clear filtrate	1	6.4	11.1
9.0	0	do	2	7.4	9.6
9.0	0		4		
11.0	15	do	1	9.8	9.8
11.0	0	do	4	8.6	11.0
11.0	0		4		
13.0	15	do	4	9.6	9.3
13.0	0	do	1	3.6	11.2
13.0	0		4		
			4	3.7	13.0
			4		

The results of this experiment showed (table 8) the effect of pH on the extraction of folic acid. Although not all of the folic acid was available in the free form after extraction at different pH levels, more was extracted at pH 5 and pH 11 than at pH 7. Folic acid was not destroyed, since parallel samples to which enzyme had been added yielded the full expected amount. In the samples that had not been heated or autoclaved prior to incubation, naturally occurring enzymes in the spinach were present to aid the extraction. These naturally occurring enzymes apparently were inhibited at pH 13.0. At pH 7.0, suspended samples did not yield an increased amount of total folic acid even though there was a slight increase in the amount of free folic acid. None of the treatments had improved the extraction of spinach samples over the standardized extraction procedure.

Results of Laboratory Analysis of Foods

The standardized microbiological assay procedures for folic acid (p. 3) were applied in the analysis of a number of foods and similar materials, and the results are summarized in table 9. To increase the usefulness of the table, folic acid contents are expressed in milligrams of folic acid

per 100 gm. of fresh weight, dry weight, and, in some foods, dry-fat-free basis. Where analyses had been made on the aqueous extract from samples incubated with and without the enzyme, these data are listed under "total" and "free" folic acid. Data from the *L. casei* and *S. faecalis* procedures are given separately.

Among the 200 foods listed, representing 348 food items, 53 were from both the Washington, D. C. area and the Texas area. Of these 53 foods, 30 in both areas were of the same range of values; 10 were higher and 13 were lower in the Texas samples than in the Washington, D. C., samples, taking into account the range of the individual foods. With the possible exception of meats, no characteristic order was found in differences in the folic acid content of food items in the two localities. In food groups such as leafy greens, green vegetables, legumes, root vegetables and fruits, some items were higher in folic acid content in one locality than in the other.

A comparison of values obtained from the use of the *L. casei* and *S. faecalis* procedures showed a general agreement for most foods. Many differences, which at times appear large between average values, cannot be considered true differences when the range of subsamples is considered. Real differences appeared, however, in the assays of rhubarb, dried figs, tangerines, mature onions, pecans, smoked ham, oats, and six of the breakfast cereals. With the exception of breakfast cereals, the results using *L. casei* were equally distributed as higher and lower than the results using *S. faecalis*. In cereals for which real differences occurred, all of the *L. casei* values were lower than the *S. faecalis* values.

In examining these differences, it should be noted that the measure of folic acid depended upon a growth response. Because *L. casei* responds to conjugates as well as to the monoglutamic acid compound, a higher *L. casei* value could be due to incomplete enzymatic conversion of conjugates. Because certain strains of *S. faecalis* respond to pteroic acid (folic acid without glutamic acid) and formylpteroic acid, neither active for *L. casei* or for animals, higher *S. faecalis* values could be due to these compounds. In this case, it might be thought that a correction could be made for their presence by using the "free" folic acid values. However, such a correction was found to be unsatisfactory. Other substances yielding growth responses to micro-organisms and not accounted for in the assay medium could yield divergent results. Unless growth-response activities of such sub-

stances were similar to those of folic acid, their presence would have been detected at the time of assay by progressive differences at the various dilution levels employed in the assay. Since *L. casei* is more sensitive to folic acid and is assayed in solutions approximately five times more dilute, it is probable that the *L. casei* values are more nearly those of biological significance than those of *S. faecalis*.

Among the foods with 1.0 mg. or more of folic acid per 100 gm. of food, dry weight, were brewer's yeast, liver concentrate, chicken liver, asparagus, broadleaf endive, calabrese broccoli, leaf lettuce, and spinach. Foods containing 0.4 to 1.0 mg. of

folic acid per 100 gm., dry weight, included most of the other leafy greens, liver, blackeye peas, dried beans, and soy flour. A few fruits and other vegetables except root vegetables made up most of the 35 foods in the group containing 0.1 to 0.4 mg. of folic acid per 100 gm., dry weight. The foods with 0.03 to 0.1 mg. of folic acid per 100 gm., dry weight, consisted mainly of root vegetables, most fresh fruits, the grains and grain products, nuts, and lean beef. The foods with 0.03 mg. or less folic acid per 100 gm., dry weight, included eggs, milk, meats (other than beef), and poultry.

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*

Food	Source	Moisture (percent)	Fat (percent)	Total folic acid content (mg./100 gm.)				
				<i>L. casei</i>				
				Number of sub- samples	Fresh weight basis		Dry weight, average	Dry weight fat-free
					Range	Average		
MEATS, EGGS								
Beef:								
Ground round	Washington, D. C., market	62.6	15.0	3	0.0052–0.0080	0.0064	0.017	0.029
Round steak	do	70.5	16.0	2	.0065–.0068	.0066	.022	.049
do	do	70.1	16.9	8	.0054–.0056	.0055	.018	.042
Texas	do	74.8	3.9	4	.0115–.0180	.0142	.056	.067
do	do	70.0	9.3	4	.0153–.0181	.0167	.056	.081
Chuck	do	74.9	4.9	1		.0149	.059	.074
do	do	71.7	8.0	2	.0144–.0166	.0155	.055	.076
Hamburg	Washington, D. C., market	62.5	19.4	3	.0043–.0054	.0049	.013	.027
Heart	Texas	75.5		4	.0018–.0042	.0031	.013	
Kidney	do	75.8		2	.0584–.0584	.0584	.241	
Liver	do	68.1		3	.2766–.3091	.2941	.922	
Sweetbreads	do	78.2		2	.0219–.0236	.0228	.105	
Lamb:								
Stew meat, ground	Washington, D. C., market	59.3	17.9	14	.0003–.0064	.0025	.006	.011
Leg	Texas	73.0		2	.0032–.0034	.0033	.012	
Liver	do	69.5		2	.2730–.2790	.2760	.905	
Rolled shoulder	do	68.6		2	.0074–.0090	.0082	.026	
Pork:								
Liver	do	68.0		2	.2090–.2330	.2210	.691	
Loin	Washington, D. C., market	66.4	12.6	2	.0032–.0032	.0032	.010	.015
Ham, smoked	do	67.7	6.9	2	.0082–.0129	.0106	.033	.042
Sausage	do	33.6	55.3	7	.0108–.0194	.0138	.021	.124
Poultry:								
Chicken, dark	Texas market	77.5		2	.0022–.0034	.0028	.013	
Chicken, white	do	77.4		3	.0026–.0035	.0031	.014	
Chicken liver	do	72.1		2	.3770–.3770	.3770	.351	
Turkey, crosscut steaks	Virginia	65.3		3	.0032–.0035	.0034	.010	
do	do	61.3		3	.0100–.0105	.0101	.026	
Turkey, steaks, light meat	do	71.5		2	.0044–.0044	.0044	.015	
Turkey	Texas market	74.4		2	.0101–.0105	.0103	.040	
Veal:								
Stew meat, ground	Washington, D. C., market	71.6	7.8	3	.0031–.0064	.0043	.015	.021
Eggs:								
Whole	Agricultural Research Center	74.4		6	.0019–.0059	.0032	.013	
White	Texas market	73.5		3	.0065–.0081	.0075	.028	
Yolk	Agricultural Research Center	87.4		7	.0002–.0007	.0004	.003	
do	Special sample	50.8		5	.0100–.0165	.0131	.027	
NUTS		dried		2			.062	
Almonds	Washington, D. C., market	3.9	52.4	9	.0275–.0680	.0447	.047	.103
Brazil Nuts	do	4.7	62.8	4	.0035–.0046	.0040	.004	.012
Coconuts	Texas market	43.8		5	.0138–.0423	.0276	.045	
Filberts	Washington, D. C., market	3.7	63.0	6	.0550–.0680	.0621	.064	.186
Peanuts	do	1.0	49.6	12	.0440–.0650	.0511	.052	.103
Pecans	do	2.4	69.9	5	.0178–.0205	.0195	.020	.070
Walnuts	do	3.3	64.7	5	.0725–.0800	.0761	.079	.238
VEGETABLES, FRESH								
Asparagus	do	93.3		4	.0740–.1100	.0893	1.333	
Beans:								
Lima	Texas A. and M. College farm	90.3		2	.1384–.1466	.1425	1.469	
Lima, bush	Washington, D. C., market	76.8		2	.0420–.0512	.0466	.201	
do	Texas A. and M. College farm	62.5		4	.0178–.0371	.0279	.074	
do	do	72.4		2	.0112–.0154	.0133	.048	
do	do	57.2		5	.0185–.0279	.0227	.053	
do	do	66.7		3	.0237–.0535	.0406	.122	
do	do	67.1		3	.0097–.0112	.0103	.031	
do	do	59.8		4	.0302–.0361	.0324	.081	
Lima, pole	do	59.3		4	.0301–.0620	.0439	.108	
	do	60.3		4	.0235–.0340	.0264	.066	

TABLE 9.—*Total and free folic acid in edible portions of foods, determined by microbiological assay with L. casei and S. faecalis—Continued*

Food	Total folic acid content (mg./100 gm.)					Free folic acid content (mg./100 gm.)					
	S. faecalis					L. casei			S. faecalis		
	Fresh weight basis			Dry weight average	Dry weight fat-free	Fresh weight basis			Fresh weight basis		
	Number of sub-samples	Range	Average			Number of sub-samples	Range	Average	Number of sub-samples	Range	Average
MEATS, EGGS											
Beef:											
Ground round.....	3	.0066-.0079	.0074	.020	.033	2	.0033-.0055	.0044	2	.0038-.0049	.0043
Round steak.....	2	.0092-.0092	.0092	.031	.068	2	.0063-.0070	.0066	2	.0083-.0083	.0083
	8	.0087-.0108	.0096	.032	.074	3	.0050-.0052	.0051	3	.0073-.0080	.0077
Chuck.....											
Hamburg.....	3	.0042-.0062	.0051	.014	.028	2	.0036-.0039	.0038	2	.0033-.0035	.0034
Heart.....											
Kidney.....											
Liver.....											
Sweetbreads.....											
Lamb:											
Stew meat, ground.....	14	.0003-.0022	.0013	.003	.006	4	.0004-.0005	.0005	4	.0002-.0005	.0004
Leg.....											
Liver.....											
Rolled shoulder.....											
Pork:											
Liver.....											
Loin.....	3	.0015-.0018	.0016	.005	.008	1		.0002	1		.0003
Ham, smoked.....	2	.0040-.0061	.0051	.016	.020	2	.0002-.0003	.0003	2	.0003-.0004	.0004
Sausage.....	9	.0057-.0136	.0093	.014	.084	2	.0005-.0006	.0006	4	.0002-.0005	.0004
Poultry:											
Chicken, dark.....											
Chicken, white.....											
Chicken liver.....											
Turkey, crosscut steaks.....	2	.0045-.0047	.0046	.013		1		.0035	1		.0039
	3	.0141-.0149	.0143	.037		2	.0070-.0095	.0083	2	.0121-.0125	.0123
Turkey, steaks, light meat.....	2	.0059-.0059	.0059	.021		1		.0039	1		.0052
Turkey.....											
Veal:											
Stew meat, ground.....	3	.0041-.0069	.0050	.018	.024	2	.0029-.0036	.0033	2	.0017-.0032	.0025
Eggs:											
Whole.....	6	.0041-.0050	.0046	.018							
White.....	7	.0006-.0007	.0007	.006							
Yolk.....	7	.0090-.0148	.0127	.026							
	2			.048							
NUTS											
Almonds.....	10	.0360-.0584	.0454	.047	.104						
Brazil Nuts.....	4	.0038-.0053	.0049	.005	.015						
Coconuts.....											
Filberts.....	7	.0555-.0887	.0711	.074	.214						
Peanuts.....	13	.0480-.0755	.0620	.063	.126						
Pecans.....	5	.0240-.0430	.0344	.035	.124						
Walnuts.....	5	.0693-.0883	.0782	.081	.244						
VEGETABLES, FRESH											
Asparagus.....	4	.0584-.1150	.0857	1.279		2	.0575-.0640	.0608	2	.0568-.0600	.0584
Beans:											
Lima.....	2	.0283-.0405	.0344	.148		1		.0047	1		.0066
Lima, bush.....											
Lima, pole.....											

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Source	Moisture (percent)	Fat (percent)	Total folic acid content (mg./100 gm.)				
				<i>L. casei</i>				
				Fresh weight basis			Dry weight, average	Dry weight fat-free
				Number of sub-samples	Range	Average		
VEGETABLES, FRESH—CON.								
Beans—Continued								
Lima, pole—Continued								
Texas A. and M. College farm		59.0		4	.0412-.0742	.0562	.137	
do		64.0		2	.0185-.0199	.0192	.053	
Snap, green		90.8		3	.0168-.0280	.0228	.248	
do		91.9		4	.0139-.0212	.0179	.221	
do		90.1		4	.0154-.0203	.0172	.174	
Texas market		91.8		3	.0288-.0337	.0312	.380	
do		92.2		2	.0115-.0156	.0136	.174	
do		91.8		2	.0378-.0433	.0406	.495	
Texas A. and M. College farm		90.6		2	.0169-.0213	.0191	.203	
do		86.6		2	.0259-.0280	.0270	.201	
do		88.5		2	.0128-.0176	.0152	.132	
Wax		91.4		2	.0328-.0385	.0357	.415	
do		92.4		2	.0172-.0224	.0198	.260	
Texas A. and M. College farm		89.8		2	.0353-.0396	.0375	.368	
do		91.2		2	.0380-.0399	.0390	.443	
do		86.0		2	.0308-.0308	.0308	.220	
Beets		85.4		3	.0126-.0183	.0150	.103	
Texas market		88.3		2	.0093-.0119	.0106	.091	
Broccoli		85.5		2	.0104-.0109	.0106	.073	
Washington, D. C., market		90.0		7	.0200-.0500	.0352	.352	
Texas market		90.8		2	.0210-.0262	.0236	.257	
do		90.5		2	.0230-.0260	.0245	.258	
Brussels sprouts		85.5		2	.1420-.1600	.1510	1.041	
Washington, D. C., market		85.0		7	.0138-.0300	.0189	.126	
Texas market		84.1		2	.0315-.0360	.0338	.212	
Cabbage:								
Chinese		Washington, D. C., market		2	.0114-.0114	.0114	.204	
Texas market		92.5		3	.0189-.0223	.0206	.275	
Red		do		2	.0143-.0199	.0171	.164	
Summer		Washington, D. C., market		3	.0054-.0069	.0064	.081	
Texas market		92.1		2	.0188-.0192	.0190	.275	
do		91.5		2	.0344-.0507	.0426	.501	
do		92.6		2	.0186-.0188	.0187	.253	
Carrots		91.4		2	.0614-.0878	.0746	.867	
Washington, D. C., market		86.9		2	.0076-.0076	.0076	.058	
do		86.7		4	.0046-.0060	.0054	.041	
do		88.4		4	.0064-.0074	.0069	.060	
Texas market		89.9		2	.0130-.0182	.0156	.154	
do		88.2		2	.0051-.0073	.0062	.053	
Cauliflower		86.8		2	.0085-.0117	.0101	.077	
Washington, D. C., market		91.6		2	.0145-.0200	.0172	.205	
Texas market		91.0		2	.0247-.0335	.0291	.323	
Celery		do		2	.0293-.0305	.0299	.325	
Washington, D. C., market		95.1		2	.0079-.0092	.0085	.173	
Texas market		94.6		2	.0043-.0061	.0052	.096	
Corn:								
Field, edible	do	77.0		4	.0188-.0270	.0234	.102	
Sweet	Washington, D. C., market	77.1		2	.0093-.0093	.0093	.041	
Texas A. and M. College farm		75.5		2	.0131-.0135	.0133	.054	
Texas market		73.9		3	.0653-.0775	.0699	.268	
Texas A. and M. College farm		81.3		2	.0652-.0690	.0671	.359	
Texas market		78.9		2	.0074-.0092	.0083	.039	
Texas A. and M. College farm		64.0		2	.0167-.0219	.0193	.054	
do		78.6		2	.0266-.0301	.0284	.133	
do		77.9		2	.0129-.0132	.0131	.059	
Cucumbers	do	83.6		3	.0153-.0325	.0243	.148	
Washington, D. C., market		95.8		2	.0085-.0088	.0087	.207	
Texas market		95.8		2	.0076-.0081	.0079	.188	
do		96.4		2	.0029-.0040	.0035	.097	

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Total folic acid content (mg./100 gm.)					Free folic acid content (mg./100 gm.)				
	<i>S. faecalis</i>					<i>L. casei</i>		<i>S. faecalis</i>		
	Fresh weight basis			Dry weight average	Dry weight fat-free	Fresh weight basis			Fresh weight basis	
	Number of sub-samples	Range	Average			Number of sub-samples	Range	Average	Number of sub-samples	Range
VEGETABLES, FRESH—CON.										
Beans—Continued										
Lima, pole—Continued										
Snap, green.....	2	.0168—.0211	.0190	.207		2	.0046—.0185	.0116	1	.0107
	3	.0220—.0246	.0232	.286		4	.0084—.0093	.0090	4	.0105—.0117
	3	.0181—.0191	.0187	.189		4	.0105—.0122	.0114	4	.0104—.0126
Wax.....										
Beets.....	2	.0169—.0184	.0177	.121		2	.0014—.0045	.0030	2	.0021—.0050
Broccoli.....	7	.0268—.0415	.0333	.333		2	.0120—.0160	.0140	2	.0075—.0085
Brussels sprouts.....	7	.0163—.0372	.0248	.165		3	.0074—.0130	.0109	3	.0089—.0178
Cabbage:										
Chinese.....	2	.0116—.0124	.0120	.214		1		.0043	1	.0058
Red.....										
Summer.....	3	.0057—.0095	.0079	.100		2	.0026—.0030	.0028	2	.0028—.0040
Carrots.....	3	.0064—.0089	.0072	.055		2	.0020—.0021	.0020	2	.0013—.0017
	4	.0056—.0063	.0059	.044		4	.0033—.0034	.0034	4	.0032—.0034
	4	.0062—.0073	.0068	.059		3	.0039—.0041	.0040	3	.0042—.0049
Cauliflower.....	2	.0103—.0152	.0128	.152		1		.0100	1	.0070
Celery.....	2	.0069—.0087	.0078	.159		1		.0027	1	.0024
Corn:										
Field, edible.....										
Sweet.....	3	.0124—.0144	.0135	.059		2	.0047—.0054	.0051	2	.0038—.0063
Cucumbers.....	2	.0073—.0079	.0076	.181		3	.0026—.0044	.0037	3	.0028—.0046

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Source	Moisture (percent)	Fat (percent)	Total folic acid content (mg./100 gm.)				
				<i>L. casei</i>			Dry weight, average	Dry weight fat-free
				Fresh weight basis		Average		
VEGETABLES, FRESH—CON.								
Eggplant.....	Washington, D. C., market.....	92.1		4	.0111– .0204	.0146	.185	.....
	Texas market.....	92.9		3	.0040– .0053	.0048	.068	.....
	do.....	92.7		2	.0074– .0084	.0079	.108	.....
Greens:								
Beet.....	Washington, D. C., market.....	89.8		2	.0315– .0315	.0315	.309	.....
	Texas market.....	91.4		2	.0381– .0396	.0389	.452	.....
Beet, immature.....	Maryland farm.....	94.3		4	.0263– .0338	.0304	.533	.....
	Texas market.....	94.2		2	.0170– .0222	.0196	.338	.....
Broccoli leaves.....	do.....	89.2		2	.0780– .1035	.0908	.841	.....
Chicory.....	Washington, D. C., market.....	95.0		3	.0236– .0304	.0280	.560	.....
Collard.....	Texas A. and M. College farm.....	89.4		3	.0858– .1133	.1018	.960	.....
Endive.....	Texas market.....	94.9		2	.0619– .0654	.0637	1.249	.....
	do.....	93.6		2	.0247– .0288	.0268	.419	.....
	Texas A. and M. College farm.....	92.6		2	.0478– .0512	.0495	.669	.....
Escarole.....	Texas market.....	94.8		2	.0233– .0283	.0258	.496	.....
Kale.....	Washington, D. C., market.....	88.5		2	.0540– .0650	.0595	.517	.....
Mustard.....	Texas market.....	91.8		2	.0354– .0399	.0377	.460	.....
	do.....	92.5		2	.0140– .0197	.0169	.225	.....
	Special sample.....	dried.....		2	.....	.....	.800	.....
	do.....	dried.....		2	.....	.....	.880	.....
Parsley.....	Texas market.....	90.5		3	.0365– .0540	.0429	.452	.....
	do.....	91.7		2	.0264– .0324	.0294	.354	.....
	do.....	89.6		2	.0426– .0432	.0429	.413	.....
Spinach.....	Washington, D. C., market.....	93.3		3	.0938– .1120	.1053	1.572	.....
	do.....	93.8		2	.0574– .0574	.0574	.926	.....
	do.....	91.9		4	.0458– .0533	.0486	.600	.....
	Texas market.....	93.1		2	.0786– .0845	.0815	1.181	.....
	do.....	91.6		2	.1120– .1170	.1145	1.363	.....
	do.....	92.9		2	.0498– .0546	.0522	.735	.....
Spinach, New Zealand.....	do.....	93.5		4	.0776– .0917	.0867	1.334	.....
Swiss chard.....	Washington, D. C., market.....	95.0		3	.0264– .0350	.0318	.636	.....
	Texas A. and M. College farm.....	92.9		3	.0606– .0691	.0639	.900	.....
	do.....	89.7		2	.0417– .0426	.0422	.410	.....
Turnip.....	Washington, D. C., market.....	92.5		4	.0534– .0826	.0695	.927	.....
	Special sample.....	dried.....		2	.....	.....	.667	.....
	Texas A. and M. College farm.....	92.1		2	.0828– .0905	.0867	1.097	.....
	do.....	89.2		2	.0939– .0956	.0948	.878	.....
Turnip, immature.....	Maryland farm.....	94.5		2	.0255– .0255	.0255	.464	.....
Water cress.....	Texas market.....	94.7		2	.0433– .0519	.0476	.898	.....
Kohlrabi.....	Texas market.....	80.5		2	.0083– .0119	.0101	.052	.....
Lettuce:								
Boston.....	Washington, D. C., market.....	96.2		3	.0100– .0129	.0112	.295	.....
Boston, immature.....	do.....	94.8		2	.0390– .0390	.0390	.750	.....
Iceberg.....	do.....	95.7		5	.0085– .0135	.0103	.240	.....
	Texas market.....	96.0		2	.0025– .0053	.0039	.098	.....
	do.....	95.7		2	.0023– .0032	.0028	.065	.....
	do.....	95.8		4	.0103– .0115	.0108	.257	.....
Leaf.....	do.....	93.5		3	.0521– .0556	.0543	.835	.....
	do.....	96.2		2	.0151– .0179	.0165	.434	.....
	do.....	94.4		2	.0521– .0647	.0584	1.043	.....
	Texas A. and M. College farm.....	92.3		2	.0436– .0464	.0450	.584	.....
Mushrooms.....	Washington, D. C., market.....	91.7		4	.0232– .0310	.0276	.333	.....
	Texas market.....	91.8		4	.0134– .0155	.0141	.172	.....
Okra.....	do.....	89.8		4	.0245– .0307	.0289	.283	.....
	Texas A. and M. College farm.....	91.6		3	.0117– .0276	.0192	.229	.....
Onions:								
Green, with tops.....	Texas market.....	91.7		2	.0113– .0138	.0126	.152	.....
Green, without tops.....	Washington, D. C., market.....	90.5		5	.0078– .0200	.0140	.147	.....
Green, tops.....	do.....	94.5		5	.0136– .0200	.0154	.280	.....
Mature.....	do.....	89.0		6	.0093– .0155	.0120	.109	.....
	Texas market.....	92.4		2	.0053– .0067	.0060	.079	.....
	do.....	92.6		2	.0108– .0173	.0141	.191	.....
Parsnips.....	Washington, D. C., market.....	78.0		2	.0067– .0367	.0367	.167	.....
	Texas market.....	80.1		2	.0083– .0087	.0085	.043	.....

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Total folic acid content (mg./100 gm.)					Free folic acid content (mg./100 gm.)					
	<i>S. faecalis</i>					<i>L. casei</i>			<i>S. faecalis</i>		
	Fresh weight basis			Dry weight average	Dry weight fat-free	Fresh weight basis			Fresh weight basis		
	Number of sub-samples	Range	Average			Number of sub-samples	Range	Average	Number of sub-samples	Range	
VEGETABLES, FRESH—CON.											
Eggplant.....	5	.0086— .0267	.0147	.186	.....	2	.0011— .0074	.0043	2	.0010— .0066	.0033
Greens:											
Beet.....	2	.0500— .0514	.0507	.497	.....	1	.....	.0135	1	.....	.0202
Beet, immature.....	6	.0249— .0310	.0282	.495	.....	2	.0225— .0290	.0258	2	.0175— .0261	.0218
Broccoli leaves.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chicory.....	3	.0271— .0354	.0316	.632	.....	2	.0042— .0063	.0053	2	.0037— .0050	.0044
Collard.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Endive.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Escarole.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kale.....	2	.0390— .0453	.0422	.367	.....	1	.....	.0443	1	.....	.0177
Mustard.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Parsley.....	2	.....	.....	1.050	.....	2	.....	.....	.....	.....	.....
2	.....	.....	.....	.874	.....	.....	.....	.....	.....	.....	.....
Spinach.....	3	.0928— .0959	.0943	1.407	.....	1	.....	.1100	1	.....	.1010
2	.0654— .0654	.0654	1.055	.....	2	.0300— .0320	.0310	2	.0360— .0360	.0360	.....
4	.0438— .0557	.0482	.595	.....	4	.0261— .0432	.0330	4	.0257— .0424	.0344	.....
Spinach, New Zealand											
Swiss chard.....	3	.0290— .0313	.0300	.600	.....	1	.....	.0048	1	.....	.0049
Turnip:											
Turnip.....	4	.0440— .0845	.0636	.848	.....	2	.0430— .0447	.0439	2	.0336— .0350	.0343
2	.....	.....	.....	.645	.....	.....	.....	.....	.....	.....	.....
Turnip, immature.....	2	.0408— .0436	.0422	.767	.....	1	.....	.0102	1	.....	.0094
Water cress.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kohlrabi.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lettuce:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston.....	3	.0108— .0109	.0109	.287	.....	1	.....	.0031	1	.....	.0026
Boston, immature.....	2	.0348— .0493	.0421	.810	.....	1	.....	.0126	1	.....	.0044
Iceberg.....	5	.0086— .0112	.0098	.228	.....	2	.0036— .0045	.0041	2	.0021— .0025	.0023
Leaf:											
Mushrooms.....	5	.0272— .0330	.0304	.366	.....	2	.0183— .0232	.0208	3	.0140— .0259	.0202
Okra.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Onions:	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green, with tops.....	5	.0088— .0110	.0098	.103	.....	1	.....	.0041	1	.....	.0039
Green, without tops.....	5	.0098— .0223	.0136	.247	.....	.....	.....	.....	.....	.....	.....
Green, tops.....	6	.0061— .0081	.0070	.064	.....	.....	.....	.....	.....	.....	.....
Mature.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Parsnips.....	3	.0247— .0269	.0257	.117	.....	2	.0062— .0073	.0068	2	.0070— .0097	.0084

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Source	Moisture (percent)	Fat (percent)	Total folic acid content (mg./100 gm.)				
				<i>L. casei</i>				
				Fresh weight basis			Dry weight, average	Dry weight fat-free
				Number of sub- samples	Range	Average		
VEGETABLES, FRESH—CON.								
Peas.....	Washington, D. C., market.....	76.8.....	.....	5.....	.0205– .0558	.0355.....	.153.....	
	do.....	74.1.....	.....	2.....	.0111– .0158	.0135.....	.052.....	
	do.....	75.1.....	.....	4.....	.0110– .0130	.0117.....	.047.....	
	do.....	75.8.....	.....	4.....	.0042– .0054	.0045.....	.019.....	
	Texas market.....	75.0.....	.....	3.....	.0175– .0379	.0269.....	.108.....	
	do.....	75.6.....	.....	7.....	.0164– .0461	.0240.....	.098.....	
	do.....	75.0.....	.....	3.....	.0096– .0346	.0203.....	.081.....	
Peppers, green.....	Washington, D. C., market.....	94.1.....	.....	2.....	.0098– .0098	.0098.....	.166.....	
	Texas market.....	93.9.....	.....	2.....	.0057– .0064	.0061.....	.100.....	
	do.....	93.5.....	.....	6.....	.0026– .0044	.0037.....	.057.....	
Potatoes:								
Green Mountain:								
Peel.....	New York.....	78.3.....	.....	2.....	.0207– .0207	.0207.....	.095.....	
Peeled.....	do.....	82.0.....	.....	3.....	.0047– .0120	.0081.....	.045.....	
Whole.....	New York (calculated).....	.....	.....				.0114.....	.058.....
Idaho.....	Texas market.....	75.6.....	.....	2.....	.0023– .0024	.0024.....	.010.....	
Irish Cobbler:								
Peel.....	Maine.....	78.3.....	.....	2.....	.0163– .0223	.0193.....	.089.....	
Peeled.....	North Carolina.....	79.1.....	.....	6.....	.0110– .0195	.0138.....	.066.....	
Whole.....	Maine.....	80.9.....	.....	2.....	.0080– .0152	.0116.....	.061.....	
	North Carolina.....	79.3.....	.....	6.....	.0035– .0042	.0037.....	.018.....	
Sebago:								
Peel.....	Alabama.....	81.4.....	.....	4.....	.0090– .0181	.0147.....	.079.....	
Peeled.....	South Carolina.....	80.1.....	.....	7.....	.0071– .0180	.0115.....	.058.....	
Whole.....	Alabama.....	80.1.....	.....	5.....	.0042– .0084	.0061.....	.031.....	
	South Carolina.....	79.8.....	.....	5.....	.0039– .0127	.0069.....	.034.....	
	Alabama (calculated).....	.....	.....				.0135.....	.068.....
	North Carolina (calculated).....	.....	.....				.0061.....	.029.....
Triumph:								
Peel.....	Alabama.....	80.4.....	.....	5.....	.0082– .0153	.0124.....	.063.....	
Peeled.....	South Carolina.....	80.4.....	.....	6.....	.0053– .0156	.0109.....	.056.....	
Whole.....	Alabama.....	81.7.....	.....	5.....	.0024– .0115	.0065.....	.036.....	
	South Carolina.....	80.9.....	.....	7.....	.0023– .0062	.0043.....	.023.....	
	Alabama (calculated).....	.....	.....				.0076.....	.041.....
	South Carolina (calculated).....	.....	.....				.0076.....	.038.....
White Rose:								
Peel.....	California.....	83.6.....	.....	3.....	.0078– .0173	.0122.....	.074.....	
Peeled.....	do.....	81.4.....	.....	2.....	.0065– .0065	.0065.....	.035.....	
Whole.....	California (calculated).....	.....	.....				.0072.....	.041.....
Pumpkin.....	Washington, D. C., market.....	93.0.....	.....	3.....	.0092– .0113	.0104.....	.149.....	
Radishes.....	Texas market.....	92.3.....	.....	3.....	.0046– .0058	.0051.....	.066.....	
	Washington, D. C., market.....	95.4.....	.....	4.....	.0030– .0039	.0034.....	.074.....	
	Texas market.....	95.4.....	.....	2.....	.0093– .0112	.0103.....	.224.....	
Rutabagas.....	Washington, D. C., market.....	95.1.....	.....	2.....	.0089– .0099	.0094.....	.192.....	
	Texas market.....	88.5.....	.....	5.....	.0048– .0100	.0069.....	.060.....	
Squash:								
Acorn.....	Washington, D. C., market.....	87.9.....	.....	2.....	.0183– .0211	.0197.....	.163.....	
Caserta.....	Texas market.....	85.7.....	.....	3.....	.0129– .0145	.0136.....	.095.....	
Crookneck.....	Texas A. and M. College farm.....	94.5.....	.....	2.....	.0099– .0120	.0110.....	.200.....	
	Washington, D. C., market.....	92.9.....	.....	2.....	.0094– .0098	.0096.....	.135.....	
	Texas market.....	92.8.....	.....	3.....	.0065– .0078	.0073.....	.101.....	
	do.....	92.6.....	.....	4.....	.0108– .0189	.0159.....	.215.....	
Cushaw.....	do.....	95.0.....	.....	2.....	.0019– .0022	.0021.....	.042.....	
Danish.....	do.....	92.3.....	.....	2.....	.0040– .0045	.0043.....	.056.....	
	do.....	93.0.....	.....	4.....	.0123– .0163	.0143.....	.204.....	
Early prolific straight neck.....	Texas A. and M. College farm.....	93.4.....	.....	2.....	.0152– .0178	.0165.....	.250.....	
Patty Pan.....	Texas market.....	94.6.....	.....	3.....	.0176– .0195	.0186.....	.344.....	
	do.....	93.7.....	.....	2.....	.0087– .0093	.0090.....	.143.....	
Zucchini.....	Texas A. and M. College farm.....	92.4.....	.....	3.....	.0148– .0304	.0239.....	.314.....	
	do.....	95.0.....	.....	2.....	.0099– .0116	.0108.....	.216.....	

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Total folic acid content (mg./100 gm.)						Free folic acid content (mg./100 gm.)					
	<i>S. faecalis</i>						<i>L. casei</i>			<i>S. faecalis</i>		
	Fresh weight basis			Dry weight average	Dry weight fat-free	Number of sub-samples	Fresh weight basis			Fresh weight basis		
	Number of sub-samples	Range	Average				Number of sub-samples	Range	Average	Number of sub-samples	Range	Average
VEGETABLES, FRESH—CON.												
Peas	6	.0188-.0445	.0301	.130		3	.0072-.0180	.0142	3	.0138-.0166	.0153	
	4	.0100-.0436	.0250	.097		2	.0063-.0074	.0069	3	.0053-.0121	.0098	
	4	.0118-.0123	.0122	.049		3	.0038-.0044	.0041	3	.0066-.0078	.0070	
	4	.0052-.0064	.0057	.024		2	.0029-.0029	.0029	2	.0032-.0038	.0036	
Peppers, green	3	.0096-.0124	.0112	.190		2	.0008-.0013	.0011	2	.0015-.0020	.0018	
Potatoes:												
Green Mountain:												
Peel	2	.0142-.0154	.0148	.068								
Peeled	3	.0061-.0069	.0066	.037								
Whole				.0088	.045							
Idaho												
Irish Cobbler:												
Peel	3	.0192-.0212	.0201	.093								
Peeled	5	.0111-.0156	.0133	.064		3	.0065-.0080	.0073	2	.0061-.0076	.0069	
Whole	2	.0092-.0120	.0106	.056								
	5	.0034-.0050	.0044	.021		3	.0022-.0027	.0025	2	.0026-.0027	.0027	
Sebago:												
Peel	5	.0069-.0142	.0106	.057		3	.0035-.0091	.0068	3	.0031-.0064	.0052	
Peeled	6	.0103-.0161	.0142	.071		4	.0053-.0080	.0069	4	.0049-.0071	.0059	
Whole	5	.0035-.0055	.0044	.022		3	.0016-.0035	.0026	3	.0015-.0032	.0022	
	5	.0035-.0069	.0053	.026		4	.0023-.0046	.0031	3	.0026-.0038	.0031	
Triumph:												
Peel	5	.0080-.0133	.0098	.050		3	.0057-.0100	.0081	3	.0046-.0077	.0062	
Peeled	5	.0054-.0119	.0086	.044		3	.0042-.0116	.0087	3	.0049-.0098	.0072	
Whole	5	.0025-.0064	.0042	.023		3	.0016-.0034	.0025	4	.0012-.0033	.0020	
	6	.0025-.0043	.0034	.018		3	.0019-.0043	.0028	4	.0013-.0034	.0022	
White Rose:												
Peel	3	.0055-.0110	.0091	.056		2	.0051-.0054	.0053	2	.0049-.0055	.0052	
Peeled	4	.0051-.0112	.0074	.040		2	.0017-.0029	.0023	2	.0013-.0028	.0021	
Whole				.0073	.041							.0026
Pumpkin	3	.0083-.0101	.0093	.133		2	.0040-.0043	.0042	2	.0037-.0063	.0050	
Radishes	4	.0031-.0040	.0036	.078		2	.0020-.0031	.0026	2	.0022-.0034	.0028	
Rutabagas	6	.0042-.0094	.0066	.057		2	.0034-.0035	.0035	3	.0030-.0031	.0031	
Squash:												
Acorn	2	.0194-.0229	.0212	.175		3	.0097-.0112	.0104	3	.0092-.0109	.0099	
Caserta												
Crookneck	2	.0135-.0135	.0135	.190		1		.0045	1		.0054	
Cushaw												
Danish												
Early prolific straight neck												
Patty Pan												
Zucchini												

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Source	Moisture (percent)	Fat (percent)	Total folic acid content (mg./100 gm.)							
				<i>L. casei</i>							
				Fresh weight basis		Dry weight, average	Dry weight fat-free				
				Number of sub- samples	Range						
VEGETABLES, FRESH—CON.											
Sweetpotatoes	Texas market	69.9		3	.0141-.0257	.0191	.064				
	do	70.0		2	.0049-.0057	.0053	.018				
Tomatoes	Washington, D. C., market	94.7		2	.0064-.0064	.0064	.121				
	Texas market	93.2		2	.0016-.0016	.0016	.023				
	Texas A. and M. College farm	93.4		3	.0029-.0042	.0034	.051				
	Texas market	92.8		4	.0112-.0184	.0155	.215				
	Texas A. and M. College farm	94.2		2	.0041-.0044	.0043	.074				
	do	94.1		2	.0038-.0038	.0038	.064				
	Texas market	93.8		2	.0010-.0012	.0011	.018				
	Texas A. and M. College farm	92.2		2	.0026-.0031	.0029	.037				
	do	93.4		2	.0053-.0057	.0055	.083				
	do	93.9		6	.0011-.0021	.0017	.028				
	do	93.6		4	.0025-.0029	.0028	.044				
	do	93.4		2	.0045-.0080	.0063	.096				
	Texas market	93.2		4	.0091-.0134	.0113	.166				
	Texas A. and M. College farm	93.4		2	.0033-.0041	.0037	.056				
	do	93.4		2	.0050-.0081	.0066	.100				
Turnips	Washington, D. C., market	91.2		3	.0035-.0042	.0039	.044				
VEGETABLES, DRIED											
Beans:											
Cowpeas	Composite of several brands	9.0		3	.3300-.4800	.3867	.425				
Kidney	do	9.4		3	.1550-.1860	.1727	.191				
Lima	do	9.1		3	.1100-.1410	.1217	.134				
Navy	Texas market	11.0		2	.0801-.0873	.0837	.094				
Pinto	Composite of several brands	11.7		3	.0940-.1440	.1133	.128				
Soybeans	Texas market	10.0		2	.1418-.1488	.1453	.161				
Lentils	1948 crop; composite U. S. sample	8.2		3	.0960-.1000	.0973	.106				
Peas:											
Black-eyed, See Beans, cowpeas.											
Green split	do	9.1		3	.0127-.0300	.0222	.024				
Yellow split	do	7.9		5	.0165-.0265	.0216	.024				
FRUITS, FRESH											
Apples:											
Red Delicious:											
Peel	Washington, D. C., market	81.4		10	.0008-.0012	.0010	.005				
Peeled	do	85.1		6	.0003-.0006	.0004	.003				
Whole	Washington, D. C. (calculated)						.0005	.003			
Winesap:											
Peel	Washington, D. C., market	81.7		10	.0007-.0011	.0010	.006				
Peeled	do	85.1		6	.0002-.0007	.0005	.003				
Whole	Texas market	84.2		4	.0006-.0012	.0008	.005				
Apricots	Washington, D. C. (calculated)						.0006	.004			
Avocados	Texas market	83.0		4	.0008-.0014	.0012	.007				
Bananas	Washington, D. C., market	87.3		5	.0007-.0063	.0025	.020				
Berries:											
Blackberries	Washington, D. C., market	86.9		4	.0043-.0049	.0047	.036				
	Texas A. and M. College farm	67.6		3	.0530-.0610	.0567	.175				
Blueberries	Washington, D. C., market	67.4		2	.0048-.0067	.0058	.018				
Cranberries	do	73.0		3	.0094-.0138	.0109	.040				
	Texas market	74.0		2	.0067-.0097	.0082	.032				

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Total folic acid content (mg./100 gm.)					Free folic acid content (mg./100 gm.)				
	<i>S. faecalis</i>					<i>L. casei</i>			<i>S. faecalis</i>	
	Fresh weight basis			Dry weight basis		Fresh weight basis			Fresh weight basis	
	Number of sub-samples	Range	Average	Dry weight average	Dry weight fat-free	Number of sub-samples	Range	Average	Number of sub-samples	Range
VEGETABLES, FRESH—CON.										
Sweetpotatoes.....										
Tomatoes.....	3	.0074-.0086	.0082	.155		2	.0039-.0041	.0040	2	.0039-.0049 .0044
Turnips.....	2	.0045-.0049	.0047	.053					1	.0020
VEGETABLES, DRIED										
Beans:										
Cowpeas.....	3	.3783-.6430	.4910	.540		2	.1590-.2100	.1845	2	.1197-.1237 .1217
Kidney.....	4	.1742-.1958	.1880	.208		1		.1160	1	.1275
Lima.....	3	.1224-.1424	.1347	.148		2	.0335-.0399	.0367	2	.0125-.0193 .0159
Navy.....	4	.1275-.1474	.1363	.154		2	.0285-.0369	.0327	2	.0090-.0126 .0108
Pinto.....	4	.0738-.1157	.0970	.106		2	.0124-.0210	.0167	1	.0072
Soybeans.....	8	.1250-.3750	.2563	.277		4	.0449-.1160	.0873	4	.0685-.1308 .0959
Lentils.....	5	.0852-.1123	.1010	.111		2	.0190-.0270	.0230	4	.0142-.0411 .0259
Peas:										
Black-eyed, See Beans, cowpeas.										
Green split.....	4	.0115-.0285	.0201	.022		3	.0040-.0086	.0064	2	.0083-.0086 .0085
Yellow split.....	5	.0259-.0383	.0304	.033		2	.0041-.0043	.0042	2	.0049-.0063 .0056
FRUITS, FRESH										
Apples:										
Red Delicious:										
Peel.....	9	.0014-.0020	.0016	.009						
Peeled.....	5	.0005-.0009	.0007	.005						
Whole.....			.0009	.006						
Winesap:										
Peel.....	9	.0013-.0016	.0014	.008						
Peeled.....	5	.0005-.0011	.0007	.005						
Whole.....			.0008	.006						
Apricots.....	5	.0016-.0048	.0027	.021		2	.0001-.0008	.0005	1	.0003
Avocados.....	3	.0430-.0446	.0440	.135		2	.0138-.0218	.0178	2	.0127-.0221 .0174
Bananas.....	3	.0093-.0113	.0102	.038		2	.0059-.0067	.0063	2	.0046-.0073 .0060
Berries:										
Blackberries.....	5	.0131-.0230	.0165	.101		3	.0098-.0173	.0129	3	.0137-.0192 .0160
Blueberries.....	3	.0065-.0086	.0074	.054		2	.0021-.0027	.0024	2	.0028-.0032 .0030
Cranberries.....	2	.0026-.0027	.0027	.021		1		.0001	1	.0010

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Source	Moisture (percent)	Fat (percent)	Total folic acid content (mg./100 gm.)				
				<i>L. casei</i>				
				Fresh weight basis			Dry weight, average	Dry weight fat-free
				Number of sub-samples	Range	Average		
FRUITS, FRESH—CONTINUED								
Berries—Continued								
Dewberries	Texas A. and M. College farm	85.2		2	.0308-.0308	.0308	.208	
	do	87.3		2	.0270-.0283	.0276	.224	
	Texas market	84.8		2	.0193-.0206	.0200	.132	
Red raspberries	Washington, D. C., market	86.4		3	.0041-.0056	.0051	.038	
Strawberries	do	91.9		4	.0034-.0056	.0046	.057	
Cantaloups	Texas A. and M. College farm	90.0		2	.0057-.0065	.0061	.061	
	Washington, D. C., market	90.4		2	.0072-.0096	.0084	.088	
Cherries, Bing	Texas A. and M. College farm	92.7		4	.0028-.0039	.0034	.047	
	Washington, D. C., market	79.6		2	.0061-.0073	.0067	.033	
Figs	do	81.3		3	.0044-.0069	.0052	.028	
Grapefruit	Washington, D. C., market	90.0		4	.0049-.0088	.0067	.039	
	Texas market	87.5		2	.0020-.0023	.0022	.022	
Grapes:								
Green	Washington, D. C., market	80.7		2	.0043-.0057	.0050	.026	
	Texas market	77.4		4	.0034-.0048	.0043	.019	
Red	Washington, D. C., market	81.3		3	.0046-.0061	.0054	.029	
	Texas market	80.8		2	.0026-.0030	.0028	.015	
Honeydew melon	Washington, D. C., market	90.8		3	.0042-.0058	.0049	.053	
Jujubes	Texas A. and M. College farm	72.9		4	.0058-.0099	.0083	.031	
Lemons	Washington, D. C., market	91.0		5	.0041-.0120	.0078	.087	
Limes	do	89.6		3	.0040-.0070	.0056	.054	
Nectarines	Texas market	84.6		3	.0129-.0271	.0201	.131	
Oranges	Washington, D. C., market	86.3		5	.0040-.0076	.0055	.040	
	Texas market	83.4		2	.0043-.0052	.0047	.028	
Orange juice	do	86.8		2	.0041-.0055	.0048	.036	
Peaches, yellow	Washington, D. C., market	88.6		3	.0021-.0025	.0023	.020	
	Texas market	84.5		4	.0010-.0019	.0013	.008	
Pears	Washington, D. C., market	85.5		2	.0021-.0025	.0023	.016	
	Texas market	83.7		4	.0013-.0023	.0018	.011	
Pineapple	Washington, D. C., market	86.3		3	.0040-.0093	.0059	.043	
	Texas market	91.2		4	.0005-.0012	.0008	.009	
Plums:								
Italian prune	do	80.6		2	.0026-.0027	.0027	.014	
Red	Washington, D. C., market	81.8		3	.0027-.0031	.0029	.016	
Yellow	Texas market	87.4		5	.0003-.0011	.0006	.005	
Rhubarb	Washington, D. C., market	88.1		4	.0007-.0011	.0010	.008	
	do	94.4		2	.0014-.0014	.0014	.025	
Tangerines	Texas market	91.5		3	.0032-.0042	.0035	.041	
Watermelon	Washington, D. C., market	88.7		2	.0069-.0078	.0074	.066	
	do	91.0		5	.0005-.0008	.0007	.008	
	Texas A. and M. College farm	90.7		3	.0002-.0004	.0003	.003	
	do	91.6		2	.0005-.0006	.0006	.007	
FRUITS, DRIED								
Apricots	Composite of several brands	27.1		2	.0044-.0049	.0047	.006	
Dates	Packaged	18.2		4	.0205-.0290	.0249	.030	
Figs	Composite of several brands	22.1		2	.0074-.0074	.0074	.010	
Mixed fruit	Fruit cake mixture	25.0		4	.0010-.0016	.0013	.002	
Peaches	Composite of several brands	24.9		2	.0040-.0065	.0053	.007	
Prunes	do	27.5		6	.0043-.0054	.0048	.007	
Raisins, seedless	do	17.2		3	.0090-.0135	.0106	.013	
CEREALS AND OTHER GRAIN PRODUCTS								
Breads:								
Cracked wheat	Washington, D. C., market	31.7		3	.0240-.0260	.0250	.037	
Dark wheat	do	32.2		4	.0235-.0300	.0271	.040	
Rye	do	35.1		2	.0155-.0159	.0157	.024	
Vienna	do	27.0		4	.0071-.0112	.0090	.012	
White	do	33.0		2	.0133-.0143	.0138	.021	

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Total folic acid content (mg./100 gm.)					Free folic acid content (mg./100 gm.)					
	<i>S. faecalis</i>					<i>L. casei</i>		<i>S. faecalis</i>			
	Fresh weight basis			Dry weight average	Dry weight fat-free	Fresh weight basis		Fresh weight basis			
	Number of sub-samples	Range	Average			Number of sub-samples	Range	Average	Number of sub-samples	Range	
FRUITS, FRESH—CONTINUED											
Berries—Continued											
Dewberries											
Red raspberries	5	.0050-.0064	.0059	.043		2	.0023-.0033	.0028	2	.0034-.0035	.0035
Strawberries	4	.0033-.0073	.0051	.063		3	.0012-.0016	.0014	3	.0014-.0022	.0018
Cantaloups	3	.0079-.0092	.0087	.091		1		.0088	2	.0080-.0096	.0088
Cherries, Bing	2	.0073-.0078	.0076	.037		2	.0031-.0036	.0034	2	.0023-.0027	.0025
Figs											
Grapefruit	2	.0026-.0029	.0028	.028		1		.0014	1		.0015
Grapes:											
Green	3	.0046-.0054	.0050	.026		2	.0009-.0011	.0010	2	.0017-.0018	.0018
Red	2	.0060-.0068	.0064	.034		2	.0029-.0031	.0030	2	.0031-.0033	.0032
Honeydew melon	2	.0077-.0077	.0077	.084		2	.0034-.0041	.0038	1		.0044
Jujubes											
Lemons	5	.0042-.0102	.0063	.070		3	.0016-.0043	.0025	3	.0018-.0029	.0024
Limes	3	.0035-.0039	.0037	.036		2	.0016-.0035	.0026	2	.0022-.0027	.0025
Nectarines											
Oranges	5	.0036-.0055	.0045	.033		3	.0013-.0044	.0025	3	.0018-.0029	.0024
Orange juice											
Peaches, yellow	2	.0021-.0024	.0023	.020		2	.0002-.0003	.0003	1		.0009
Pears	2	.0035-.0035	.0035	.024		1		.0006	1		.0008
Pineapple	3	.0025-.0048	.0040	.029		3	.0015-.0017	.0016	3	.0013-.0016	.0014
Plums:											
Italian prune											
Red	3	.0025-.0034	.0030	.017		2	.0002-.0007	.0005	2	.0008-.0010	.0009
Yellow	2	.0014-.0014	.0014	.012		2	.0001-.0002	.0002	1		.0004
Rhubarb	3	.0024-.0032	.0029	.052					1		.0005
Tangerines	2	.0041-.0044	.0043	.038		1		.0014	1		.0012
Watermelon	5	.0006-.0008	.0007	.008		4	.0001-.0005	.0004	3	.0002-.0005	.0003
FRUITS, DRIED											
Apricots	4	.0038-.0050	.0046	.006		2	.0004-.0027	.0016	2	.0015-.0016	.0016
Dates	4	.0232-.0265	.0245	.030		2	.0103-.0116	.0110	2	.0071-.0106	.0089
Figs	4	.0117-.0179	.0146	.019		1		.0032	1		.0052
Mixed fruit	6	.0009-.0034	.0018	.002		1		.0001	1		.0004
Peaches	2	.0034-.0056	.0045	.006		1		.0033	1		.0019
Prunes	4	.0052-.0065	.0060	.008		3	.0026-.0036	.0030	2	.0036-.0043	.0040
Raisins, seedless	4	.0079-.0123	.0106	.013		2	.0068-.0076	.0072	2	.0060-.0071	.0066
CEREALS AND OTHER GRAIN PRODUCTS											
Breads:											
Cracked wheat	4	.0231-.0333	.0290	.042							
Dark wheat	5	.0273-.0387	.0335	.049							
Rye	3	.0208-.0272	.0238	.037							
Vienna	4	.0108-.0159	.0134	.018							
White	2	.0162-.0163	.0163	.024							

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Source	Moisture (percent)	Fat (percent)	Total folic acid content (mg./100 gm.)				
				<i>L. casei</i>				
				Fresh weight basis			Dry weight, average	Dry weight fat-free
				Number of sub- samples	Range	Average		
CEREALS AND OTHER GRAIN PRODUCTS—CONTINUED								
Breakfast cereals:								
Cornflakes	Washington, D. C., market	4.0		3	.0033– .0070	.0050	.005	
Corn meal:								
White	do	7.6		4	.0064– .0068	.0067	.007	
Yellow	do	8.6		4	.0055– .0073	.0064	.007	
Corn and soya	do	2.0		4	.0510– .0700	.0616	.063	
Hominy grits	do	8.5		8	.0025– .0065	.0038	.004	
Oat, ready to eat	do	3.7		3	.0216– .0250	.0227	.024	
Oat, precooked infant food	Special sample	4.4		4	.0385– .0395	.0388	.041	
Oatmeal	Washington, D. C., market	8.0		4	.0275– .0312	.0298	.032	
Rice, ready to eat	do	4.5		4	.0058– .0060	.0059	.006	
Wheat bran	do	4.4		3	.0733– .0836	.0796	.083	
Wheat farina	do	9.8		4	.0073– .0182	.0129	.014	
Wheat flakes	do	3.5		4	.0160– .0195	.0178	.018	
Wheat, malted barley, etc.	do	2.7		5	.0235– .0422	.0330	.034	
Wheat, precooked infant food	Special sample	3.6		4	.0526– .0690	.0608	.063	
Wheat, shredded:								
Brand I	Washington, D. C., market	7.0		3	.0272– .0310	.0292	.032	
Brand II	do	4.2		4	.0451– .1099	.0716	.075	
Flour:								
Cake, unenriched	Special sample	8.1		4	.0041– .0058	.0050	.005	
Gluten	do	4.9		6	.0238– .0297	.0270	.028	
Rye	Washington, D. C., market	10.1		2	.0161– .0164	.0163	.018	
Soy	Special sample			2			.355	
White, enriched	Washington, D. C., market	9.9		4	.0061– .0080	.0067	.007	
	do	10.6		4	.0031– .0075	.0057	.006	
	do	9.9		4	.0074– .0095	.0081	.009	
Whole wheat	do	10.2		2	.0350– .0370	.0360	.040	
Grains:								
Barley	1948 crop; composite U. S. sample	11.1		5	.0300– .0650	.0404	.045	
Corn, yellow	do	10.7		5	.0130– .0365	.0234	.026	
Flaxseed	do	5.9		5	.0316– .0730	.0467	.050	
Oats, white	do	10.7		5	.0160– .0263	.0235	.026	
Rice:								
Brown	Arkansas Experiment Station	4.9		3	.0158– .0310	.0209	.022	
	Louisiana Experiment Station	4.7		2	.0310– .0355	.0333	.035	
	Washington, D. C., market	9.4		4	.0108– .0120	.0113	.012	
	Louisiana Experiment Station	4.7		5	.0172– .0368	.0234	.025	
Milled	Washington, D. C., market	11.2		2	.0122– .0130	.0126	.014	
Rough	Louisiana Experiment Station	4.8		2	.0140– .0178	.0159	.017	
	Arkansas Experiment Station	5.1		4	.0103– .0180	.0141	.015	
	do	4.8		2	.0290– .0290	.0290	.031	
Rye	Louisiana Experiment Station	4.3		5	.0265– .0324	.0298	.031	
Sorghum, grain:								
White kafir	do	10.9		5	.0153– .0212	.0183	.021	
Yellow milo	do	10.2		4	.0181– .0260	.0214	.024	
Wheat:								
Durum	do	9.5		7	.0165– .0356	.0270	.030	
Hard Red Spring	do	8.5		7	.0273– .0530	.0408	.045	
Hard Red Winter	do	10.4		6	.0295– .0447	.0356	.040	
Red Durum	do	8.4		6	.0267– .0370	.0314	.034	
Soft Red Winter	do	10.6		7	.0245– .0335	.0306	.034	
White	do	10.6		7	.0340– .0420	.0379	.042	
MILK AND CHEESE								
Milk:								
Buttermilk	Texas A. and M. College Creamery	87.9		3	.0061– .0137	.0111	.092	

TABLE 9.—*Total and free folic acid in edible portions of foods, determined by microbiological assay with L. casei and S. faecalis—Continued*

Food	Total folic acid content (mg./100 gm.)				Free folic acid content (mg./100 gm.)					
	S. faecalis			L. casei		S. faecalis				
	Fresh weight basis		Dry weight average	Dry weight fat-free	Fresh weight basis		Fresh weight basis			
	Number of sub-samples	Range	Average		Number of sub-samples	Range	Average	Number of sub-samples		
CEREALS AND OTHER GRAIN PRODUCTS—CONTINUED										
Breakfast cereals:										
Cornflakes.....	2	.0045-.0076	.0061	.006	2	.0019-.0025	.0022	1	.0033	
Corn meal:										
White.....	4	.0084-.0117	.0100	.011	2	.0016-.0016	.0016	3	.0016-.0030	.0023
Yellow.....	4	.0076-.0116	.0101	.011	4	.0019-.0035	.0028	2	.0029-.0033	.0031
Corn and soya.....	4	.0915-.1071	.0987	.101	2	.0135-.0207	.0171	3	.0090-.0127	.0114
Hominy grits.....	6	.0040-.0049	.0045	.005	2	.0018-.0024	.0021	2	.0024-.0034	.0029
Oat, ready to eat.....	2	.0215-.0228	.0222	.023	1		.0059	1	.0066	
Oat, precooked infant food.....	4	.0429-.0547	.0476	.050	1		.0156	2	.0188-.0195	.0192
Oatmeal.....	4	.0208-.0396	.0312	.034	3	.0046-.0092	.0064	2	.0061-.0121	.0091
Rice, ready to eat.....	4	.0063-.0127	.0094	.010	2	.0033-.0035	.0034	2	.0055-.0057	.0056
Wheat bran.....	3	.1058-.1508	.1208	.126	2	.0225-.0258	.0242	2	.0385-.0546	.0466
Wheat farina.....	4	.0113-.0169	.0143	.016	3	.0042-.0065	.0052	2	.0056-.0085	.0071
Wheat flakes.....	4	.0235-.0375	.0290	.030	2	.0096-.0098	.0097	2	.0120-.0128	.0124
Wheat, malted barley, etc.....	5	.0406-.0646	.0522	.054	3	.0140-.0300	.0240	2	.0244-.0376	.0310
Wheat, precooked infant food.....	4	.0607-.0821	.0712	.074	1		.0368	2	.0245-.0446	.0346
Wheat, shredded:										
Brand I.....	2	.0383-.0383	.0383	.041	2	.0082-.0083	.0083	1	.0107	
Brand II.....	4	.0468-.1369	.0868	.091	2	.0103-.0351	.0227	2	.0184-.0385	.0285
Flour:										
Cake, unenriched.....	4	.0071-.0096	.0082	.009						
Gluten.....	6	.0377-.0468	.0416	.044						
Rye.....	3	.0165-.0215	.0197	.022						
Soy.....	2			.460						
	2			.490						
White, enriched.....	4	.0092-.0098	.0095	.011						
	4	.0041-.0103	.0083	.009						
	5	.0095-.0117	.0102	.011						
Whole wheat.....	2	.0393-.0428	.0410	.046						
Grains:										
Barley.....	5	.0571-.0625	.0597	.067	4	.0105-.0284	.0171	4	.0182-.0317	.0249
Corn, yellow.....	4	.0188-.0308	.0238	.027	3	.0037-.0051	.0045	2	.0044-.0065	.0055
Flaxseed.....	4	.0368-.0534	.0470	.050	3	.0153-.0200	.0174	2	.0183-.0298	.0241
Oats, white.....	4	.0454-.0663	.0557	.062	2	.0069-.0196	.0133	2	.0261-.0273	.0267
Rice:										
Brown.....	3	.0237-.0240	.0239	.025	2	.0108-.0118	.0113	2	.0055-.0058	.0056
	2	.0372-.0400	.0386	.041	1		.0315	1	.0218	
	3	.0180-.0196	.0186	.021	3	.0051-.0059	.0056	3	.0081-.0091	.0088
	6	.0210-.0378	.0281	.030	2	.0086-.0089	.0088	3	.0067-.0094	.0083
	2	.0190-.0208	.0199	.022	2	.0066-.0066	.0066	2	.0094-.0094	.0094
	2	.0161-.0189	.0175	.018	1		.0078	1	.0058	
Milled.....	5	.0094-.0181	.0141	.015	3	.0057-.0081	.0073	3	.0035-.0067	.0056
Rough.....	3	.0278-.0378	.0336	.035	2	.0110-.0220	.0165	2	.0118-.0200	.0159
	5	.0381-.0430	.0409	.043	3	.0132-.0182	.0149	3	.0181-.0217	.0199
	3	.0270-.0442	.0352	.040	2	.0106-.0200	.0153	2	.0098-.0147	.0123
Rye.....										
Sorghum, grain:										
White kafir.....	5	.0177-.0263	.0226	.025	3	.0035-.0064	.0052	3	.0020-.0084	.0055
Yellow milo.....	4	.0177-.0250	.0223	.025	3	.0085-.0125	.0103	3	.0071-.0151	.0122
Wheat:										
Durum.....	7	.0350-.0633	.0504	.056	2	.0134-.0135	.0135	1	.0302	
Hard Red Spring.....	7	.0368-.0650	.0511	.056	2	.0130-.0157	.0144	1	.0306	
Hard Red Winter.....	7	.0350-.0443	.0397	.044	3	.0063-.0102	.0088	2	.0127-.0157	.0142
Red Durum.....	6	.0462-.0603	.0526	.057	2	.0085-.0281	.0183	2	.0182-.0350	.0266
Soft Red Winter.....	7	.0256-.0810	.0493	.055	3	.0045-.0109	.0079	2	.0164-.0173	.0169
White.....	7	.0369-.0493	.0434	.049	2	.0062-.0079	.0071	2	.0143-.0146	.0145
MILK AND CHEESE										
Milk:										
Buttermilk.....										

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Source	Moisture (percent)	Fat (percent)	Total folic acid content (mg./100 gm.)				
				<i>L. casei</i>				
				Fresh weight basis			Dry weight, average	Dry weight fat-free
				Number of sub- samples	Range	Average		
MILK AND CHEESE—CON.								
Milk—Continued								
Evaporated.....	Canned.....	72.9	.....	10	.0003– .0012	.0007	.003	.....
Nonfat dry.....	Special sample.....	2.2	.....	3	.0015– .0033	.0024	.002	.....
Pasteurized.....	Texas A. and M. College Creamery.....	86.9	.....	3	.0003– .0009	.0006	.005	.....
Cheese:								
Cheddar.....	New York State.....	34.6	.....	4	.0122– .0126	.0124	.019	.....
	Wisconsin.....	33.4	.....	2	.0167– .0225	.0196	.029	.....
Cottage.....	Washington, D. C., market.....	72.8	.....	4	.0253– .0287	.0265	.097	.....
Processed.....	Texas A. and M. College Creamery.....	77.2	.....	3	.0169– .0242	.0208	.091	.....
	Composite of several types.....	34.2	.....	4	.0094– .0127	.0106	.016	.....
MISCELLANEOUS								
Bacto liver extract.....	Special sample.....	.....	20	.7605–1.0000	.8987	.....	.....	.....
Brewer's yeast.....	do.....	.....	2	.....	.....	1.965	.....	.....
Casein, vitamin-free.....	do.....	5.3	.....	3	.0042– .0049	.0046	.005	.....
Fat, hydrogenated.....	do.....	.....	4	.00000– .00008	.00004	.....	.....	.....
Liver concentrate.....	do.....	.....	2	.....	.....	1.817	.....	.....
Spinach, dried.....	do.....	2.4	.....	55	.8600–1.3900	1.0600	1.086	.....
Yeast residuals.....	do.....	.....	10	.7700– .9500	.8630	.....	.....	.....

TABLE 9.—Total and free folic acid in edible portions of foods, determined by microbiological assay with *L. casei* and *S. faecalis*—Continued

Food	Total folic acid content (mg./100 gm.)					Free folic acid content (mg./100 gm.)				
	<i>S. faecalis</i>					<i>L. casei</i>		<i>S. faecalis</i>		
	Fresh weight basis			Dry weight basis		Fresh weight basis			Fresh weight basis	
	Number of sub-samples	Range	Average	Dry weight average	Dry weight fat-free	Number of sub-samples	Range	Average	Number of sub-samples	Range
MILK AND CHEESE—CON.										
Milk—Continued										
Evaporated.....	10	.0003– .0039	.0022	.008						
Nonfat dry.....	3	.0025– .0039	.0034	.003						
Pasteurized.....										
Cheese:										
Cheddar.....	4	.0137– .0150	.0146	.022						
Cottage.....	4	.0443– .0517	.0465	.171						
Processed.....	5	.0108– .0133	.0116	.018						
MISCELLANEOUS										
Bacto liver extract.....	20	.7840–1.0660	.9692			4	.7200– .8437	.7909	4	.7780– .9000 .8340
Brewer's yeast.....	2			2.180						
Casein, vitamin-free.....	2	.0063– .0068	.0065	.007						
Fat, hydrogenated.....	4	Not measurable								
Liver concentrate.....	2			1.972						
Spinach, dried.....	56	.8200–1.3900	1.0970	1.124						
Yeast residuals.....	10	.7400–1.0020	.8670							

PART II. COMPILED DATA ON FOLIC ACID CONTENT OF FOODS

The present compilation of values for the folic acid content of foods (table 10) includes most of the data made available from 1941 through early 1951. During this period the methods were being developed and improved. The results reflect varying degrees of progress toward standardization and should be compared with this in mind. A summary of the results of collaborative assays undertaken in 1947, 1948, and 1949 by the Association of Official Agricultural Chemists (43, 44, 45) has been included to demonstrate the improvement in methods for the determination of folic acid in foods.

Studies reporting data on the folic acid content of foods were found in many different types of journals, including some foreign publications not generally available. In addition to the values found in studies of the folic acid content of foods, numerous values were found in reports primarily concerned with comparative studies, which are of special interest to the research worker. Such investigations included studies on completeness of extraction and degradation of conjugated forms, variation in methods, nutritional requirements of poultry, bacterial synthesis, storage of fresh, frozen, and canned products, variety, maturity, and processing.

Results of early assays were based on arbitrary standards of potency and were reported in terms of concentrates of folic acid produced from spinach. These concentrates were designated as having a potency such as 3,100 or 40,000 times the potency of a special liver fraction with an assumed folic acid potency of one. The noncrystalline spinach concentrate, regarded as nearly pure folic acid, has been reported as having a potency of 137,000 times the standard liver fraction (60). Crystalline folic acid standards from other sources have been reported as having potencies of 160,000 and 200,000 times the standard liver preparation (83, 95). Since there was no agreement on the potency of pure folic acid in terms of the special liver fraction, the figure 200,000 was selected for use in recalculating the values reported in table 10 in terms of a low potency standard (95). Pure or nearly pure crystalline standards were available for later studies.

All values in this table, except where otherwise noted, have been reported in terms of milligrams of folic acid per 100 gm. of food. Since different units were used by the various authors, simple calculations were necessary to convert the reported figures to this basis. Because the authors had expressed their data to different decimal places, differences appear in this table.

Explanation of the Table of Compiled Values

Foods for which one or more analyses were available from published and unpublished sources are listed in alphabetical order in the first column of table 10. Subclassifications as raw, canned, dried, defatted, and sprouted are included in this column.

The second column describes the sample from data given by the author concerning the origin, variety, season, age, size, number of samples, diets, scientific name, and for some foreign articles, the local name. In a few experiments the sample had been divided into several portions that were subjected to various conditions of storage.

The third column includes notes on the preliminary treatment of the sample which in most cases was used to release bound folic acid as well as to convert conjugates to the monoglutamic acid compound. The use of two enzyme preparations simultaneously is indicated by a hyphen between the names of the preparations. Treatments involving successive procedures are shown by separating the stages by semicolons. Some foods for which data have been reported in Part I of this publication were tested by both organisms under conditions considered suitable for yielding data for both "free" and "total" folic acid. In a very few cases comparisons of methods or variations in methods have been reported. These are indicated after the comments on preliminary treatment. When the potency of an impure standard has been designated, the value is given in italics

after the notes concerning preliminary treatment of the sample. In this compilation the value 200,000 has been used for the potency of pure folic acid to convert the reported figure, which is in terms of an impure standard, to a value in terms of pure folic acid. Both values are shown in table 10, with the reported value in italics and the calculated value in brackets on the following line. The calculated values should be considered approximations only.

Most studies on the folic acid content of food have been made by microbiological assays with either *Streptococcus faecalis* or *Lactobacillus casei* as test organisms. Values obtained by the use of these two organisms are listed in columns 4a, 4b, 5a, and 5b. Column 6a is used for the few instances when an average value has been given for tests made with both organisms or when a value has been reported but the test organism has not been specified.

Values obtained by biological and chemical assays are listed in column 7a. Only two reports have been noted for folic acid estimations by chemical methods.

The term "moisture-free" basis has been reserved for those values reported on such a basis and are listed in columns 4b, and 5b. All other values are listed under "moist" basis in columns 4a, 5a, 6a, and 7a, and represent the product as described, that is, raw, canned, cured, defatted, dried, smoked, etc.

The final column of this table lists the references to the sources of the data.

TABLE 10.—Compiled data on the folic acid content of foods

Values obtained with impure standards have been recalculated on the basis of potency 200,000 for pure folic acid and are given on the following line. Values in column (b) under each method heading represent calculations on a moisture-free basis. All other values are listed under column (a) and represent the product as described.

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>						
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)				
Almond-----	Washington, D. C., market; 10 <i>S. faecalis</i> , 9 <i>L. casei</i> .	Buffered; autoclaved; chicken pancreas; average and range.	{ 0.0454 .0360-.0584	0.047	0.0447 .0275-.0680	0.047	-----	-----	114		
Apple and var- ious parts: Raw-----	1 sample, 5 specimens-----	Takadiastase-papain; 40,000 [200,000]-----	.008 [.0016]	.055 [.011]	-----	-----	-----	-----	25		
	1 sample-----	Takadiastase-----	.001	-----	-----	-----	-----	-----	90		
	Anton-----	Buffered; heated 45 minutes (abstract); chemical method.	-----	-----	-----	-----	-----	0.317	8		
	Red Delicious; Washington, D. C., market: Whole calculated from peeled +peel.	Buffered; autoclaved; chicken pancreas; average.	[.0009]	[.006]	[.0005]	[.003]	-----	-----	-----		
	Peeled; 5 <i>S. faecalis</i> , 6 <i>L. casei</i> .	Buffered; autoclaved; chicken pancreas; average and range.	{ .0007 .0005-.0009	.005	.0004 .0003-.0006	.003	-----	-----	-----		
	Peel; 9 <i>S. faecalis</i> , 10 <i>L. casei</i> .	do-----	{ .0016 .0014-.0020	.009	.0010 .0008-.0012	.005	-----	-----	-----		
	Winesap; Washington, D. C., market: Whole calculated from peeled +peel.	Buffered; autoclaved; chicken pancreas; average.	[.0008]	[.006]	[.0006]	[.004]	-----	-----	-----		
	Peeled; 5 <i>S. faecalis</i> , 6 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0007 .0005-.0011	.005	.0005 .0002-.0007	.003	-----	-----	-----		
	Peel; 9 <i>S. faecalis</i> , 10 <i>L. casei</i> .	do-----	{ .0014 .0013-.0016	.008	.0010 .0007-.0011	.006	-----	-----	-----		
	Winesap; Texas market: Whole; 4-----	do-----	-----	-----	{ .0012 .0008-.0014	.007	-----	-----	114		
Apricot: Raw-----	Peeled; 4-----	do-----	-----	-----	{ .0008 .0006-.0012	.005	-----	-----	-----		
	Washington, D. C., market: 1 <i>S. faecalis</i> , 2 <i>L. casei</i> -----	Buffered; autoclaved; average and range	.0003	-----	{ .0005 .0001-.0008	-----	-----	-----	-----		
	5-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0027 .0016-.0048	.021	.0025 .0007-.0063	.020	-----	-----	-----		
	Texas market; 4-----	do-----	-----	-----	{ .0047 .0043-.0049	.036	-----	-----	-----		

Dried-----	Composite of several brands:	Buffered; autoclaved; average and range	{ .0016 .0015-.0016	.0016	.0016								
	2-----			.0046	.006	.0047	.006						
	4 <i>S. faecalis</i> , 2 <i>L. casei</i> -----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0038-.0050			.0044-.0049							
Asparagus:		Water extract-----	.048		.042								
Raw-----	Garden or retail sample-----	Acid hydrolysis-----	.018		.013								90
		Alkaline hydrolysis-----	.033		.034								
		Takadiastase-----	.048		.044								
	Garden or greenhouse sample-----	Buffered; heated 3 minutes; hog kidney	.124	1.20	.118	1.17							
	Garden or greenhouse sample-----	do-----		1.200		1.200							
	Stored in a wax bag:												
	1 day at room temperature-----	do-----		.930		.750							
	2 days at room temperature-----	do-----		.560		.560							41
	3 days at room temperature-----	do-----		.320		.260							
	1 week in refrigerator-----	do-----		.880		.910							
	2 weeks in refrigerator-----	do-----		.840		.720							
	1 week in crushed ice-----	do-----		.990		.960							
	2 weeks in crushed ice-----	do-----		1.400		1.100							
	High-quality sample-----	Takadiastase-----	.010										120
		Hog kidney-----	.014										
35	Washington, D. C., market:												
	2-----	Buffered; autoclaved; average and range	{ .0584 .0568-.0600		.0608								
	4-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0857 .0584-.1150	1.279	.0893	1.333							114
	Washington, D. C., market-----	Buffered; autoclaved-----	.016										
		Buffered; autoclaved; takadiastase-----	.017										
		Buffered; autoclaved; chicken pancreas-----	.025										
	Texas A. and M. College Farm;	Buffered; autoclaved; chicken pancreas; average and range.											
	2-----												
Canned-----	Green; solid and liquid; 10 samples, 60 cans.	Takadiastase; average and range-----	{ .0058 .0032-.0079		.0090								59
					.0062-.0112								41
Avocado:		Buffered; heated 3 minutes; hog kidney-----	.022	.353	.021	.337							
Raw-----	Aguacate (<i>Persea gratissima</i> L.)	Takadiastase-----	.026	.091									50
		Rat growth method; fed 2.0 gm. per day-----											
	<i>Persea gratissima</i> L.-----	Rat growth method; fed 1.0 gm. per day-----											
		(Rat growth method; fed 0.5 gm. per day-----											
	Washington, D. C., market:												
	2-----	Buffered; autoclaved; average and range	{ .0174 .0127-.0221		.0178								
	3-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0440 .0430-.0446	.135	.0567	.175							114
	Fuerte; Texas market; 2-----	do-----											
Banana:													
Raw-----	1 sample, 6 specimens-----	Takadiastase-papain; 40,000-----	.095	.39									25
		[200,000]-----	[.019]	[.078]									
		Takadiastase; 40,000-----	.096										117
		[200,000]-----	[.0192]										
	Slightly green; 3 samples-----	Takadiastase-----	.013		.021								
	Ripe; 3 samples-----	do-----	.007		.015								90
	Very ripe; 4 samples-----	do-----	.004		.008								
	Washington, D. C., market:												
	2-----	Buffered; autoclaved; average and range	{ .0060 .0046-.0073		.0063								114

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both			
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Banana—Con. Raw—Continued	Washington, D. C., market—Con. 3-----	Buffered; autoclaved; chicken pancreas; average and range. .0102 .0093-.0113	.038	.0109 .0094-.0138	.040				114	
	Texas market; 2-----	do-----		.0082 .0067-.0097	.032					
Dwarf-----	Plátano dominico (<i>Musa caven-</i> <i>dishii</i> Lam.)	Takadiastase-----	.022	.074					50	
India-----	Plátano morado (<i>Musa rosacea</i> Jacq.)	do-----	.012	.060					50	
Barley: Whole grain-----		Takadiastase-papain; 3, 100 [200,000]-----		1.45 |.0225|					20	
	Ground-----	Buffered; heated 3 minutes; hog kid- ney; method a.	.063		.051				91	
		Buffered; heated 3 minutes; hog kid- ney; method b.			.047				91	
	Feedstuff; 5 samples-----	Buffered; autoclaved; hog kidney; av- erage and range. .049 .039-.063		.041 .029-.051					41	
	Feedstuff; 3 tests-----	Chick growth method; average and range						.06 .00-.14	75	
	1948 crop; composite U. S. sample: 4-----	Buffered; autoclaved; average and range .0249 .0182-.0317			.0171 .0105-.0284				114	
	5-----	Buffered; autoclaved; chicken pancreas; average and range. .0597 .0571-.0625		.067	.0404 .0300-.0650	.045			114	
Sprouted, dehydrated	Seed, shoot, and root-----	Takadiastase-papain; 3, 100 [200,000]-----		5.00 |.0775|					20	
Bean and bean products: Broad:	Haba (verde) (<i>Vicia faba</i> L.)	Takadiastase-----	.127	.408					50	
Raw-----	Haba (sin cáscara) (<i>Vicia faba</i> L.)	do-----	.162	.176					50	
Dry seed-----	do-----	do-----	.173	.188					50	
Common or kidney: Snap green: Raw-----	High-quality sample-----	Takadiastase----- Hog kidney-----	.021 .052						120	

	Ejotes (<i>Phaseolus vulgaris</i> L.)	Takadiastase	.010	.080	.041				50
	Garden or retail; 2 samples	Takadiastase; average and range	{ .051 .043-.059		.040-.041				
	Garden or retail sample	Takadiastase	.199		.185				90
	Stored 3 days at room temperature.	do	.108		.129				
	Stored 13 days in refrigerator	do	.222		.222				
	Stored 13 days iced	do	.216		.204				
	Garden or greenhouse; 4 samples.	Buffered; heated 3 minutes; hog kidney; average and range.	{ .071 .054-.090	.62 .48-.82	.071 .051-.081	.62 .48-.77			
	Garden or greenhouse sample	Buffered; heated 3 minutes; hog kidney	.500		.480				
	Stored in a wax bag:								
	1 day at room temperature	do	.310		.290				41
	3 days at room temperature	do	.220		.250				
	1 week in refrigerator	do	.280		.370				
	1 week in crushed ice	do	.340		.410				
	Small beans from 3 plants	do	.093	1.02	.079	.87			
	Large beans from same 3 plants	do	.090	.69	.081	.62			
	Washington, D. C., market:								
	1 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	.0107		{ .0116 .0046-.0185				
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0190 .0168-.0211	.207	.0228 .0168-.0280	.248			
	Washington, D. C., market:								
	4	Buffered; autoclaved; average and range	{ .0111 .0105-.0117		.0090 .0084-.0093				
	3 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0232 .0220-.0246	.286	.0179 .0139-.0212	.221			
	Washington, D. C., market:								
	4	Buffered; autoclaved; average and range	{ .0112 .0104-.0126		.0114 .0105-.0122				
	3 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0187 .0181-.0191	.189	.0172 .0154-.0203	.174			114
	Washington, D. C., market								
	Texas market; 3	Buffered; autoclaved; chicken pancreas; average and range.			.0255				
	Texas market; 2	do			.0312 .0288-.0337	.380			
	Kentucky Wonder; Texas market; 2	do			.0136 .0115-.0156				
	Bountiful; Texas A. and M. College Farm; 2	do			.0406 .0378-.0433	.495			
	Stringless Black Valentine; Texas A. and M. College Farm; 2	do			.0270 .0259-.0280	.201			
	Tendergreen; Texas A. and M. College Farm; 2	do			.0191 .0169-.0213	.203			
	Solid and liquid; 11 samples, 66 cans.	Takadiastase; average and range	{ .0029 .0012-.0083		.0152 .0128-.0176	.132			59
Canned	Solid and liquid; 2 samples, 2 cans.	Buffered; heated 3 minutes; hog kidney	.011	.190	.007	.127			41
	Stored 2 months at 70° F.	do					.005		
	Stored 2 months at 90° F.	do					.002		
	Stored 2 months at 100° F.	do					.001		
	Stored 4 months at 70° F.	do					.001		
	Stored 4 months at 90° F.	do					.003		
	Stored 4 months at 100° F.	do					.002		
							.002		17

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both			
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Beans-etc. —Continued										
Common or Kidney—C	continued									
Raw	Garden or greenhouse; 2 sam- ples.	Buffered; heated 3 minutes; hog kid- ney; average and range.	{ .027 .018-.035	.27 .16-.38	.023 .013-.033	.24 .12-.36			41	
	Golden wax; Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			{ .0357 .0328-.0385	.415				
	do	do			{ .0198 .0172-.0224	.260				
	Kentucky Wonder; Texas A. and M. College Farm; 2.	do			{ .0308 .0308-.0308	.220			114	
	Stringless; Texas A. and M. College Farm; 2.	do			{ .0390 .0380-.0399	.443				
	Sure Crop; Texas A. and M. College Farm; 2.	do			{ .0375 .0353-.0396	.368				
Canned	Frijol bayo (<i>Phaseolus vulgaris</i> L.)	Buffered; heated 3 minutes; hog kidney— Takadiastase	.008 .101	.182 .110	.006	.136			41	
Dry seeds	Red kidney (<i>Phaseolus vulgaris</i> L.)	Fed boiled and dried; rat growth method							50	
	Red kidney; composite of sev- eral brands:							.50	11	
1	1	Buffered; autoclaved	.1275		.1160					
	4 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .1880 .1742-.1958	.208	{ .1727 .1550-.1860	.191			114	
	Navy (<i>Phaseolus vulgaris</i> L.)	Fed boiled and dried; rat growth method								
	Navy; Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			{ .1453 .1418-.1488	.161			11	
	Navy; composite of several brands:									
2	2	Buffered; autoclaved; average and range	{ .0108 .0090-.0126		.0327 .0285-.0369					
	4 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .1363 .1275-.1474	.154	{ .1133 .0940-.1440	.128				
	Pinto; Texas market; 2	do			{ .0718 .0662-.0773	.079			114	
	Pinto; composite of several brands:									
	1 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	.0072		{ .0167 .0124-.0210					
	4 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0970 .0738-.1157	.106	{ .0973 .0960-.1000	.106				

Cowpea: Snap-----	1947 horticultural duplicates analyzed:						
	Alabunch-----	Buffered; autoclaved; chicken pancreas; average.	.100	.918			
	Alacrowder-----	do-----	.087	.800			
	Asparagus-----	do-----	.138	1.190			
	California No. 5-----	do-----	.062	.588			
	Chinese Red-----	do-----	.095	.830			
	Extra Early Blackeye-----	do-----	.075	.697			
	Long Pod Cream-----	do-----	.133	1.330			
	Bunch Purple Hull-----	do-----	.080	.806			
	Above 8 varieties in 1947-----	Average-----	.096	.895			
Shell-----	Above 8 varieties including every determination.	Range-----	.058-.235	.558-2.020			
	California No. 5: 1947, old-----	Buffered; autoclaved; chicken pancreas-----	.619				
	Duplicate from same plot-----	do-----	.558				
	1948, June 11, young-----	do-----	.530		.552		
	Duplicate from same plot-----	do-----	.676		.525		
	1948, June 16, young-----	do-----	.452		.552		
	Duplicate from same plot-----	do-----	.432		.550		
	1948, June 11, old-----	do-----	.716		.344		
	Duplicate from same plot-----	do-----	.548		.312		
	1948, June 16, old-----	do-----	.576		.635		
	Duplicate from same plot-----	do-----	.326		.657		

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item	Description of sample*	Preliminary treatment of sample; method; potency designation of impure standard (in italics)	Folic acid (mg./100 gm.)						Reference No.	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
(1)	(2)	(3)	Moist basis (4a)	Moisture-free basis (4b)	Moist basis (5a)	Moisture-free basis (5b)	Moist basis (6a)	Moist basis (7a)	(8)	
Beans—Con. Cowpea—Continued Shell—Continued	Duplicate from same plot 1947, yellow green and yellow pods.	Buffered; autoclaved; chicken pancreas	.145 .083			.252				
Dry seed	Duplicate from same plot 1948, June 11, yellow pods.	do	.093						98	
	Duplicate from same plot 1948, June 16, yellow pods.	do	.258			.353				
	Duplicate from same plot 1948, June 16, yellow pods.	do	.292			.328				
	Duplicate from same plot 1948, June 16, yellow pods.	do	.052			.149				
	Duplicate from same plot 1947 horticultural duplicates analyzed: Alabunch	Takadiastase-papain; 40,000 [200,000]	.74 [.148]	.80 [.16]					25	
	Alacrowder	Buffered; autoclaved; chicken pancreas; average.	.413	.455						
	Asparagus	do	.341	.373						
	Blackeye Crowder No. 21	do	.427	.465						
	Blackeye No. 8152	do	.395	.439						
	California No. 5	do	.374	.417						
	Chinese Red	do	.352	.387						
	Extra Early Blackeye	do	.213	.232						
	Long Pod Cream	do	.403	.453						
	Bunch Purple Hull	do	.442	.489						
	Regular Purple Hull	do	.294	.330						
	Above 11 varieties in 1947	Average	.397	.437						
	Above 11 varieties including every determination.	Range	.368	.407						
	1947 California No. 5	Buffered; autoclaved; chicken pancreas	.136-.689	.150-.749						
	Replicate from same plot	do	.326							
	do	do	.487							
	do	do	.279							
	1948 California No. 5	do	.454							
	Duplicate from same plot	do	.430			.393				
	Composite of several brands:		.416			.356				
	2	Buffered; autoclaved; average and range	.1217 .1197-.1237		.1845 .1590-.2100					
	3	Buffered; autoclaved; chicken pancreas; average and range.	.4910 .3783-.6430	.540	.3867 .3300-.4800	.425			11	
Hyacinth: Dry seed	Black beans (<i>Dolichos lablab</i> L.)	Fed boiled and dried; rat growth method						.05		

Lima:							
Raw	Frozen; 1 sample	Autolysis	.016				
		Takadiastase	.008				
		Hog kidney	.023				
Bush; Texas A. and M. College Farm:		Buffered; autoclaved; chicken pancreas; average and range.					
Clark; 4	Fordhook; 2	do					
	Henderson; 5	do					
Oklahoma; 3	do						
Peerless; 3	do						
Thorogrew; 4	do						
Pole; Texas A. and M. College Farm:							
Carolina; 4	do						
Florida; 4	do						
Speckled; 4	do						
TAES; 2	do						
Washington, D. C., market:							
1	Buffered; autoclaved	.0066					
2	Buffered; autoclaved; chicken pancreas; average and range.	.0344 .0283-.0405	.148				
Dry seed	1 sample, 1 pound	Takadiastase-papain; 40,000 [200,000]	.33 [.066]	.36 [.072]			
Composite of several brands:							
2	Buffered; autoclaved; average and range	.0159 .0125-.0193					
3	Buffered; autoclaved; chicken pancreas; average and range.	.1347 .1224-.1424	.148				
Mung:							
Dry seed	Texas market; 2	do					
Sprouted	Fresh sprouting seeds	Takadiastase-papain					
	do	do					
Pigeonpea:							
Dry seed	Cajanus cajan (L.) Millsp.	Fed boiled and dried; rat growth method					
Soybean:							
Dry seed	Peking	Takadiastase-papain					
	do	do					
	Manchu	do					
	do	do					
	Mukden	do					
	do	do					
	Lincoln	do					
	do	do					
	Dunfield	do					
	do	do					

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both			
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Beans—Con. Soybean—Co Dry seed— Continued Continued Ilini.....		Takadiastase-papain.....					.216		21	
		do.....					.199			
		Anwei.....					.231			
		do.....					.207			
		Feedstuff; 1 sample.....	Buffered; autoclaved; hog kidney.....	.530		.360				
		1948 crop; composite U. S. sample: 4.....	Buffered; autoclaved; average and range	{ .0959 .0685-.1308		.0873 .0449-.1160				
		8.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .2563 .1250-.3750	.277	.1923 .1425-.2680	.208			
		Flour.....	Untreated.....	.046						
		1 sample.....	Chicken pancreas.....	.255						
			Hog kidney.....	.280						
42			Chicken pancreas; hog kidney.....	.335					107	
		1948 Association of Official Agricultural Chemists col- laborative assay.....	Buffered; autoclaved; chicken pancreas; specified method; average and range.	{ .429 .263-.550		.407 .214-.58				
			Buffered; autoclaved; chicken pancreas or hog kidney; other than specified method; average and range.	{ .517 .340-.710		.417 .320-.5095				
		1949 A.O.A.C. collaborative ass- say.....	Chick weight method; 4 laboratories; average and range.						44	
			Chick hematocrit method; 1 laboratory							
			Chick hemoglobin method; 1 laboratory							
			Buffered; autoclaved; chicken pancreas; specified method; average and range.	{ .3933 .260-.490		.4146 .30-.64				
			Buffered; autoclaved; chicken pancreas or other treatment; other than speci- fied method; average and range.	{ .35 .163-.47		.55				
			Chick growth method; 1 laboratory						45	
			Chick blood method; 1 laboratory							
Meal.....			Microbiological and chick assays.....				.5			
		Special sample; 2.....	Buffered; autoclaved; chicken pancreas		.460		.355		46	
		do.....	do.....		.490		.400			
			Buffered; autoclaved.....	.118						
			Buffered; autoclaved; hog kidney.....	.165					114	
			Buffered; autoclaved; chicken pancreas	.386						
			do.....	.398		.358				
								.6	46	

Sprouted	Fresh sprouting seeds:						
	Peking	Takadiastase-papain				.073	
	do	do				.069	
	Manchu	do				.129	
	do	do				.124	
	Mukden	do				.103	
	do	do				.137	
	Lincoln	do				.139	
	do	do				.108	
	Dunfield	do				.113	
Beef:	do	do				.109	
	Illini	do				.107	
	do	do				.097	
	Anwei	do				.088	
	do	do				.113	
	Brain	1 sample					
		Autolysis; 40,000 [200,000]			.052 [.0104]		
		Autolysis; 40,000 [200,000]			.011 [.0022]		
		Takadiastase; 40,000 [200,000]			.052 [.0104]		
		Papain; 40,000 [200,000]			.045 [.009]		
Chuck		Pepsin; 40,000 [200,000]			.021 [.0042]		
		1 sample, 1 specimen			Takadiastase-papain; 40,000 [200,000]	.052 [.0104] .24 [.048]	
					.013	.012	
					.011	.012	
					.016	.011	
					.015	.010	
		Texas market; 1.				.0149	.059
		Texas market; 2.				.0155	.055
		Washington, D. C., market:				.0144-.0166	
		2					
Hamburg		Buffered; autoclaved; average and range				.0034	.0038
						.0033-.0035	.0036-.0039
		3				.0051	.013
		Buffered; autoclaved; chicken pancreas; average and range.				.0042-.0062	.0043-.0054
		Washington, D. C., market				.00375	.00506
		1 sample					
		Autolysis; 40,000; average				.05	
		[200,000]				[.01]	
		2 samples; 3 specimens					
		Takadiastase-papain; 40,000; average			.11	.47	
Heart		[200,000]			[.022]	[.094]	
		40,000; range			.056-.16		
		[200,000]			[.0112-.032]		
		Texas A. and M. College Animal Husbandry; 4.					
		1 sample				.0031	.013
		Autolysis; 40,000				[.0018-.0042]	
		[200,000]					
		Takadiastase			.030	.035	
		do			.043	.056	
		Texas A. and M. College Animal Husbandry; 2.				.0584	.241
Kidney		Buffered; autoclaved; chicken pancreas; average.					
		1 sample					
Liver:		Autolysis; 40,000				.50	
		[200,000]				[.10]	

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Other assays Moist basis (8)	Reference No. (8)		
			Microbiological assays									
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both					
			Moist basis (4a)	Moisture-free basis (4b)	Moist basis (5a)	Moisture-free basis (5b)	Moist basis (6a)	Moist basis (7a)				
Beef—Con. Liver—Cont. Raw—Con.	Dried	{ Autolysis; 40,000 [200,000] Takadiastase; 40,000 [200,000] Autoclaved 30 minutes; 40,000 [200,000] Autolysis 24 hours 37° C. 40,000 [200,000] Takadiastase-papain, 2 hours at 50° C., pH 4.5 40,000 [200,000] Takadiastase-papain, 2 hours 70° C., pH 4.5 40,000 [200,000] Takadiastase-papain, 4 hours at 50° C., pH 4.5 40,000 [200,000] Takadiastase-papain, 4 hours at 55° C., pH 4.5 40,000 [200,000] Takadiastase-papain, 6 hours at 55° C., pH 4.5 40,000 [200,000] Takadiastase-papain, 24 hours at 37° C., pH 4.5 40,000 [200,000] Takadiastase-papain, 48 hours at 37° C., pH 4.5 40,000 [200,000] Takadiastase-papain; 40,000; average [200,000] 40,000; range [200,000] Takadiastase-papain; 40,000 [200,000] Takadiastase; 40,000 [200,000] Takadiastase do do do do Takadiastase or other enzyme (abstract); chemical method. Buffered; autoclaved; chicken pancreas; average and range. Takadiastase; 40,000 [200,000]	.25 [.05] .43 [.086] .19 [.038] .82 [.164] .72 [.144] .69 [.138] .73 [.146] .73 [.146] .61 [.122] .88 [.176] .87 [.174] .38 [.076] .32-.43 [.064-.086] .574 [.1148] .68-1.4 [.136-.28] .060 .150 .044 .064 .097 1.44 .2941 [.2766-.3091] 4.63 [.923]							24		
Texas A. and M. College Ani- mal Husbandry; 3. Dried	1 liver									25		
										26		
										117		
										103		
										113		
										1.57		
										8		
										114		
										117		

Lung	1 sample	Autolysis; 40,000 [200,000]	.17 [.034]						130
Muscle	1 sample	Autolysis; 40,000 [200,000] Autolysis; 40,000 [200,000] Takadiastase pH 3.0; 40,000 [200,000] Malt diastase pH 4.5; 40,000 [200,000] Pancreatic amylase pH 7.0; 40,000 [200,000] Pepsin pH 1.8; 40,000 [200,000] Trypsin pH 8.3; 40,000 [200,000] Pancreatin, pH 8.3; 40,000 [200,000] Takadiastase; 40,000 [200,000] Takadiastase-papain; method a, turbidimetric. Takadiastase-papain; method a, acidimetric. Takadiastase-papain; method b, acidimetric. Water extract; mild heat; chemical method.	.048 [.0096] .020 [.004] .031 [.0062] .030 [.006] .022 [.0044] .010 [.002] .026 [.0052] .019 [.0038] .095 [.019]						24
	1 sample	Takadiastase; 40,000 [200,000]	.044						117
	1 sample	Takadiastase-papain; method a, turbidimetric. Takadiastase-papain; method a, acidimetric. Takadiastase-papain; method b, acidimetric. Water extract; mild heat; chemical method.	.046						100
Rib	Rib eye muscle	Takadiastase	.017	.011				.015	103 92
Round: Raw	1 sample, 4 specimens	Takadiastase-papain; 40,000 [200,000] No treatment pH 4 autoclaved 12 hours 0.1 N KOH autoclaved 1 hour 2 N KOH autoclaved 30 minutes Takadiastase Chicken pancreas Takadiastase do do do Buffered; autoclaved; average and range	.10 [.02] .007 .006 .004 .009 .015 .007 .033 .021 .024 .0083	.34 [.068]	.006	.007	.005	<.0005 .014 .004	25 76 103
	1 sample								103
	Washington, D. C., market; 2	Buffered; autoclaved; chicken pancreas; average and range	.0092	.031	.0066 .0063-.0070 .0066 .0065-.0068	.022			114
	Washington, D. C., market:	3	Buffered; autoclaved; average and range	{ .0077 .0073-.0080		.0051			
		8	Buffered; autoclaved; chicken pancreas; average and range	{ .0096 .0087-.0108	.032	.0050-.0052 .0055 .0054-.0056	.018		
	Washington, D. C., market:	2	Buffered; autoclaved; average and range	{ .0043 .0038-.0049		.0044			
		3	Buffered; autoclaved; chicken pancreas; average and range	{ .0074 .0066-.0079	.020	.0033-.0055 .0064 .0052-.0080	.017		
	Texas market; 4	do			{ .0167 .0153-.0181	.056			

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both				
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)				
Beef—Con. Round—Con. Raw—Continued	Texas market; 4.....	Buffered; autoclaved; chicken pancreas; average and range.			.0142	.056			114		
		No enzyme treatment; specified method; average and range.			.0115-.0180						
Dried, defatted.	1947 A.O.A.C. collaborative as- say.	Buffered; autoclaved; chicken pancreas; specified method; average and range.			.0282				43		
		No enzyme treatment; other than spe- cified method; average and range.			.013-.074						
		Other treatments or other methods; average and range.			.047						
Spleen.....	1 sample.....	Autolysis; 40,000..... [200,000].....		.21 [.042]					130		
Sweetbread..	Texas A. and M. College Ani- mal Husbandry; 2. Pancreas; 1 sample.....	Buffered; autoclaved; chicken pancreas; average and range.			.0228	.105			114		
		Autolysis; 40,000..... [200,000].....		1.6 [.32]							
		Thymus; 1 sample.....			.50						
		Autolysis; 40,000..... [200,000].....			[.10]						
Testes.....	Bull; 1 sample.....	Autolysis; 40,000..... [200,000].....			.42				130		
	Calf; 1 sample.....	Autolysis; 40,000..... [200,000].....			.8						
				[.16]							
Beet: Raw.....	1 sample, 3 specimens.....	Takadiastase-papain; 40,000..... [200,000].....	.045 [.009]	.34 [.068]					25		
	1 sample.....	Takadiastase-papain; 40,000..... [200,000].....	.090 [.018]						26		
		No treatment.....	.005		.005						
		pH 4 autoclaved 12 hours.....	.008		.003						
		0.1 N KOH autoclaved 1 hour.....	<.002		<.002						
		2N KOH autoclaved 30 minutes.....	<.002		<.002						
		Takadiastase.....	.028		.023						
		Chicken pancreas.....	.008		.007						
	High-quality sample.....	Takadiastase.....	.016						120		
		Hog kidney.....	.022								
	Garden or greenhouse sample.....	Buffered; heated 3 minutes; hog kidney.....			.042	.24			41		
		Buffered; heated 45 minutes(abstract); chemical method.						.24	8		

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item	Description of sample*	Preliminary treatment of sample; method; potency designation of impure standard (in italics)	Folic acid (mg./100 gm.)						Reference No.	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
(1)	(2)	(3)	(4a)	(4b)	(5a)	(5b)	(6a)	(7a)	(8)	
Bread—Con. Wheat—Cont. inued	Whole wheat; 2 samples, 2 specimens.	Takadiastase-papain: 40,000; average [200,000]069 [.0138]	.11 [.022]	—	—	—	—	25	
	White; Washington, D. C., market; 2.	Buffered; autoclaved; chicken pancreas; average and range. [200,000] . . . . .	.052-.086 [.0104-.0172]	—	—	—	—	—	
	Vienna; Washington, D. C., market; 4.	do . . . . .	.0163 .0162-.0163 .0134 .0108-.0159 .0290 .0231-.0333	.024 — .018 — .042 —	.0138 .0133-.0143 .0090 .0071-.0112 .0250 .0240-.0260	.021 — .012 — .037 —	—	—	
	Cracked wheat; Washington, D. C., market; 4 <i>S. faecalis</i> , 3 <i>L. casei</i> .	do	{ .0335 .0273-.0387	.049	.0271 .0235-.0300	.040	—	—	114	
	Dark wheat; Washington, D. C., market; 5 <i>S. faecalis</i> , 4 <i>L. casei</i> .	do	{ .0238 .0208-.0272	.037	.0157 .0155-.0159	.024	—	—		
Rye	Washington, D. C., market; 3 <i>S. faecalis</i> , 2 <i>L. casei</i> .	Water extract058	—	.080	—	—	—	90	
	Garden or retail sample	Takadiastase . . . . .	.054	—	.083	—	—	—	
Broccoli: Raw	Garden or greenhouse sample	Hog kidney090	—	.110	—	—	—	41	
	Washington, D. C., market; 2	Buffered; heated 3 minutes; hog kidney . . . . .	.090	—	.110	—	—	—	
	7	Buffered; autoclaved; average and range	{ .0080 .0075-.0085	—	.0140 .0120-.0160	—	—	—		
	do	do	{ .0333 .0268-.0415	.333	.0352 .0200-.0500	.352	—	—		
	Texas market; 2	do	—	—	{ .0236 .0210-.0262	.257	—	—		
	do	do	—	—	{ .0245 .0230-.0260	.258	—	—	114	
	Calabrese; Texas A. and M. College Farm; 2	do	—	—	{ .1510 .1420-.1600	1.041	—	—		
	Texas market; 2	do	—	—	—	—	—	—		
	do	do	—	—	—	—	—	—		
	do	do	—	—	—	—	—	—		
Broccoli leaves: Raw	Texas market; 2	do	—	—	{ .0908 .0780-.1035	.841	—	—	114	
Brussels sprouts: Raw	Washington, D. C., market; 3	Buffered; autoclaved; average and range	{ .0124 .0089-.0178	—	.0109 .0074-.0130	—	—	—		

	7.	Buffered; autoclaved; chicken pancreas; average and range.	.0248 .0163-.0372	.165	.0189 .0138-.0300	.126		
	Washington, D. C., market	Buffered; autoclaved; chicken pancreas	.0162		.0163			
	Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			.0338 .0315-.0360	.212		
	Texas market; 4	do			.0310 .0283-.0330	.200		
Buttermilk:	Texas A. and M. College creamery; 3.	do			.0111 .0061-.0137	.092		
Cabbage:								
Raw	1 sample, 1 specimen	Takadiastase-papain; 40,000 [200,000]	.065 [.013]	.78 [.156]				25
	Garden or retail sample	Takadiastase	.012					90
	Col (<i>Brassica oleracea</i> L. var. <i>capitata</i>)	do	.006	.084				50
	White; high-quality sample	do	.009					120
		Hog kidney	.041					8
		Buffered; heated 45 minutes (abstract); chemical method.	.21					.29
		Autolysis	0					120
	Red; high-quality sample	Takadiastase	.021					120
		Hog kidney	.037					
	Washington, D. C., market:							
	2	Buffered; autoclaved; average and range	.0034 .0028-.0040		.0028 .0026-.0030			
	3	Buffered; autoclaved; chicken pancreas; average and range.	.0079 .0057-.0095	.100	.0064 .0054-.0069	.081		
	Texas market; 2	do			.0190 .0188-.0192	.275		
	do	do			.0426 .0344-.0507	.501		114
	do	do			.0187 .0186-.0188	.253		
	Red; Texas market; 2	do			.0171 .0143-.0199	.164		
	Wakefield; Texas A. and M. College Farm; 2.	do			.0746 .0614-.0878	.867		
Cabbage, chinese or celery:								
Raw	1 assay	Takadiastase; 40,000 [200,000]	.20 [.04]					
	2 assays	Takadiastase; rat liver; 40,000 [200,000]	.49 [.098]					85
	Washington, D. C., market:	Takadiastase; 40,000 [200,000]	.02, .09 [.004, .018]					
	1	Takadiastase; rat liver; 40,000 [200,000]	.14, .20 [.028, .04]					
	2	Buffered; autoclaved	.0058		.0043			
		Buffered; autoclaved; chicken pancreas; average and range.	.0120 .0116-.0124	.214	.0114 .0206	.204 .275		114
	Texas market; 3	do			.0189-.0223			
Cantaloup:								
Raw	1 sample, 3 specimens	Takadiastase-papain; 40,000 [200,000]	.13 [.026]	1.3 [.26]				25

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TABLE 10.—Compiled data on the folic acid content of foods—Continued

Washington, D. C., market; 4	Buffered; autoclaved; average and range	{ .0033 .0032-.0034		.0034									
	Buffered; autoclaved; chicken pancreas; average and range.	{ .0059 .0056-.0063	.044	.0054	.041								
Washington, D. C., market:				.0046-.0060									
3-----	Buffered; autoclaved; average and range	.0044		.0040									114
4-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0042-.0049 .0068 .0062-.0073	.059	.0069	.060								
Texas market; 2-----	do			.0064-.0074									
-----do-----	do			.0156	.154								
-----do-----	do			{ .0130-.0182 .0062 .0051-.0073									
Canned-----	Solid and liquid; 10 samples, 60 cans.	Takadiastase; average and range	{ .0013 .0010-.0022	.0041									59
	Solid and liquid; 2 samples, 2 cans.	Takadiastase; average		.0022-.0057									
	Stored 4 months at 70° F.	do											17
	Stored 4 months at 90° F.	do											
	Stored 4 months at 100° F.	do											
Cassava:													
Raw-----	<i>Manihot esculenta</i> , Crantz, Cuban market.	Buffered; autoclaved; takadiastase; chicken pancreas.		.00004									10
Cauliflower:													
Raw-----	2 samples, 2 specimens-----	Takadiastase-papain; 40,000; average [200,000]-----	.14 [.028]	1.2 [.24]									25
		40,000; range. [200,000]-----	.11-.16 [.022-.032]										
	Garden or retail sample-----	Water extract-----	.006		.051								
		Acid hydrolysis-----	.020		.026								
		Alkaline hydrolysis-----	.006		.022								
		Takadiastase-----	.010		.045								
		Water extract-----	.010		.057								
	do-----	Acid hydrolysis-----	.015		.021								90
		Alkaline hydrolysis-----	.008		.024								
		Takadiastase-----	.017		.062								
		Water extract-----	.009		.050								
	do-----	Acid hydrolysis-----	.022		.041								
		Alkaline hydrolysis-----	.008		.057								
		Takadiastase-----	.024		.070								
	Coliflor (<i>Brassica oleracea</i> L. var. <i>botrytis</i>). High-quality sample-----	do-----	.016	.139									50
		do-----	.012										
		Hog kidney-----	.032										
		Buffered; heated 3 minutes; autolysis pH 4.5-----	.026										
		Buffered; heated 3 minutes; takadiastase-----	.026										
		Buffered; heated 3 minutes; Rhozyme P-11-----	.015										
	1 sample-----	Buffered; heated 3 minutes; Protease 15-----	.017										
		Buffered; heated 3 minutes; hog kidney-----	.087										
		Buffered; heated 3 minutes; takadiastase; hog kidney-----	.095										
		Buffered; heated 3 minutes; Rhozyme; hog kidney-----	.039										91

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TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg., 100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both				
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)				
Cauliflower: Raw—Continued	1 sample—Continued.	Buffered; heated 3 minutes; Protease; hog kidney.	.052						91		
	Garden or greenhouse sample	Buffered; heated 3 minutes; hog kidney.	.044						41		
		Buffered; heated 45 minutes (abstract); chemical method.							8		
	Washington, D. C., market:										
	1	Buffered; autoclaved.....	.0070		.0100						
	2	Buffered; autoclaved; chicken pancreas; average and range.	.0128 .0103-.0152	.152	.0172 .0145-.0200	.205					
	Texas market; 2	do			.0291 .0247-.0335	.323			114		
		do			.0299 .0293-.0305	.325					
Celery: Raw	White, high-quality sample	{ Takadiastase..... Hog kidney.....	.004 .024						120		
	Pascal; high-quality sample	{ Takadiastase..... Hog kidney.....	.003 .029								
	Washington, D. C., market:										
	1	Buffered; autoclaved.....	.0024		.0027						
	2	Buffered; autoclaved; chicken pancreas; average and range.	.0078 .0069-.0087	.159	.0085 .0079-.0092	.173					
	Washington, D. C., market	Buffered; autoclaved; chicken pancreas	.00715		.00665				114		
	Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			.0052 .0043-.0061	.096					
	Pascal; Texas market; 2	do			.0074 .0059-.0088	.164					
Celery greens: Raw		Buffered; heated 45 minutes (abstract); chemical method.						.30	8		
Chard: Raw	1 sample	{ Takadiastase; 40,000..... [200,000].....	.38 [.076]						85		
		{ Takadiastase; rat liver 40,000..... [200,000].....	.42 [.084]								
	Garden or retail sample	Water extract.....	.071		.076						
		Takadiastase.....	.086		.087						
		Hog kidney.....	.123		.123						
	3 samples	Takadiastase; average and range.....	.100 .086-.125		.111 .087-.142				90		
	Garden or retail sample	Takadiastase.....		1.15		1.30					
	Stored 3 days at room temperature.	do		.50		.35					

	Stored 15 days in refrigerator	do	.55	.50				
	Stored 15 days iced	do	1.25	1.30				
Acelgas (<i>Beta vulgaris</i> L.)	do	.024	.298					50
	Buffered; heated 3 minutes; incubated pH 4.5.	.027						
	Buffered; heated 3 minutes; takadiastase.	.025						
	Buffered; heated 3 minutes; hog kidney.	.080						
	Autolyzed in water	.050						
1 sample	Incubated pH 4.5.	.061						91
	Takadiastase	.060						
	Takadiastase (corrected for conjugate content of takadiastase).	(.054)						
	Hog kidney	.079						
High-quality sample	Takadiastase	.011						120
	Hog kidney	.066						
Garden or greenhouse:								
5 <i>S. faecalis</i> , and 6 <i>L. casei</i> samples.	Buffered; heated 3 minutes; hog kidney; average and range.	{ .070 .044-.125	.62 .32-1.00	.062 .040-.125	.53 .32-100			
Garden or greenhouse sample	Buffered; heated 3 minutes; hog kidney		.730		.570			
Stored in a wax bag:								
1 day at room temperature	do		.740		.600			
2 days at room temperature	do		.830		.800			
3 days at room temperature	do		.630		.460			
1 week in refrigerator	do		.840		.610			
2 weeks in refrigerator	do		.700		.640			
1 week in crushed ice	do		.950		.770			
2 weeks in crushed ice	do		.970		1.000			
Garden or greenhouse sample	do		.390		.360			41
Stored in a wax bag:								
1 day at room temperature	do		.320		.320			
2 days at room temperature	do		.280		.220			
1 week in refrigerator	do		.480		.420			
2 weeks in refrigerator	do		.320		.330			
1 week in crushed ice	do		.500		.430			
2 weeks in crushed ice	do		.350		.350			
Garden or greenhouse sample	do		1.000		1.000			
Stored in a wax bag:								
3 days at room temperature	do		.480		.740			
2 weeks in refrigerator	do		.540		.650			
2 weeks in crushed ice	do		1.200		1.300			
Washington, D. C., market:								
1	Buffered; autoclaved	.0049		.0048				
3	Buffered; autoclaved; chicken pancreas; average and range.	{ .0300 .0290-.0313	.600	.0318 .0264-.0350	.636			
Lucullus; Texas A. and M. College Farm; 3.	do			{ .0639 .0606-.0691	.900			114
Lucullus; Texas A. and M. College Farm; 2.	do			{ .0422 .0417-.0426	.410			
Cheese:								
Cheddar	1 sample	Takadiastase-papain; 40,000 [200,000]	.030 [.006]	.045 [.009]				25
	1 sample	Takadiastase	.005					90
	Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			{ .0196 .0167-.0225	.029		
	New York State; 4	do	{ .0146 .0137-.0150	.022	{ .0124 .0122-.0126	.019		114

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item	Description of sample*	Preliminary treatment of sample; method; potency designation of impure standard (in italics)	Folic acid (mg./100 gm.)					Other assays	
			Microbiological assays						
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both		
(1)	(2)	(3)	Moist basis (4a)	Moisture-free basis (4b)	Moist basis (5a)	Moisture-free basis (5b)	Moist basis (6a)	Moist basis (7a)	Reference No. (8)
Cheese—Con.									
Cottage-----	Texas A. and M. College Creamery; 3.	Buffered; autoclaved; chicken pancreas; average and range.			.0208 .0169-.0242	.091			
Processed-----	Washington, D. C., market; 4	do	.0465 .0443-.0517	.171	.0265 .0253-.0287	.097			
Cherry:									
Raw-----	Composite, 5 <i>S. faecalis</i> , 4 <i>L. casei</i> .	do	.0116 .0108-.0133	.018	.0106 .0094-.0127	.016			
Chicken:									
Breast-----	Bing; Texas market; 3	do			.0052 .0044-.0069	.028			
Heart-----	Washington, D. C., market; 2	Buffered; autoclaved; average and range	.0025 .0023-.0027		.0034 .0031-.0036				114
Kidney-----	2 samples, 2 specimens	Buffered; autoclaved; chicken pancreas; average and range.	.0076 .0073-.0078	.037	.0067 .0061-.0073	.033			
Leg-----									
Leg-----	Old hen	Takadiastase-papain; 40,000; average [200,000]	.15 [.03]	.60 [.12]					25
Leg-----		40,000; range [200,000]	.098-.20 [.0196-.04]						46
Leg-----							.005		
Liver-----	Old hen; 1 sample	Autolysis; 40,000 [200,000]		.25 [.05]					126
Leg-----		Averaged results from digestion with takadiastase and digestion with hog kidney; average and range.	.021 .019-.023						87
Kidney-----		No treatment	.047		.043				
Kidney-----		pH 4 autoclaved	.047		.044				
Kidney-----		0.1 N KOH autoclaved 1 hour	<.005		<.005				
Kidney-----		2 N KOH autoclaved 30 minutes	.034		.040				
Kidney-----		Takadiastase	.26		.12				
Kidney-----		Chicken pancreas	.049		.045				
Kidney-----		Averaged results from digestion with takadiastase and digestion with hog kidney; average and range.	.16 .10-.22						87
Leg-----									
Leg-----	Chicks 4-5 weeks old; PGA deficient basal ration+2.00 mg. PGA per kg. ration; 6 samples (2 each).	Takadiastase-papain; 40,000; average [200,000]	.12 [.024]	.54 [.108]					25
Leg-----	2 samples, 4 specimens	40,000; range [200,000]	.095-.15 [.019-.03]						46
Leg-----							.005		
Liver-----	Old hen; 1 sample	Autolysis; 40,000 [200,000]		1.2 [.24]					126

do	do	40,000 [200,000]	2.4 [.48]		.10-.35	46
White leghorn; 8-13 weeks old; early diet deficient.	Buffered; pH 7.0; incubated	.616				
do	do	.974				
do	do	.164				
do	do	.428				
do	do	.016				
do	do	.512				
do	do	.458				
do	do	.792				
1 sample	No treatment	.14		.17		
	Autolysis	.21		.23		
	pH 4 autoclaved 12 hours	.16		.21		
	0.1 N KOH autoclaved 1 hour	<.04		.06		
	2 N KOH autoclaved 30 minutes	.07		.13		
	Takadiastase	.42		.38		
	Chicken pancreas	.30		.26		
White leghorns; 4 weeks old; PGA deficient basal ration:	Takadiastase; average and range	{ .107 .079-.152				
Basal ration; 6 chicks	do	{ .235 .146-.308				
Basal ration+0.25 mg. PGA per kg. ration; 5 chicks.	do	{ .352 .197-.451				
Basal ration+1.000 mg. PGA per kg. ration; 6 chicks.	do	{ 1.47 1.19-1.64				
Basal ration+10.0 mg. PGA per kg. ration; 6 chicks.	do	{ .10 .04-.21				
White leghorns; 5 weeks on PGA deficient basal ration.	do	{ .39 .36-.43				
White leghorns; 5 weeks on PGA deficient basal ration+ 2.00 mg. PGA per kg. ration.	Averaged results from digestion with takadiastase and digestion with hog kidney; average and range.	{ .305 .18-.43				
White leghorns; 4-5 weeks old; PGA deficient basal ration+ 2.00 mg. PGA per kg. ration; 6 samples (2 each).	No treatment; range				.07-.19	
3-4-week-old chicks on purified diet with and without PGA supplement.	Autolysis; range				.80-1.21	
White leghorn chickens:	Chicken pancreas; range				1.13-1.40	
Basal diet; 12 chicks	Autolysis pH 4.5	.20				
Basal diet+0.05 mg. PGA per kg. diet; 4 chicks.	Autolysis pH 7.0	.15				
Basal diet+0.10 mg. PGA per kg. diet; 8 chicks.	Hog kidney	.21				
Basal diet+0.20 mg. PGA per kg. diet; 7 chicks.	Chicken pancreas	.19				
	Autolysis pH 4.5	.13				
	Autolysis pH 7.0	.15				
	Hog kidney	.11				
	Chicken pancreas	.15				
	Autolysis pH 4.5	.13				
	Autolysis pH 7.0	.20				
	Hog kidney	.25				
	Chicken pancreas	.31				
	Autolysis pH 4.5	.22				
	Autolysis pH 7.0	.22				
	Hog kidney	.32				
	Chicken pancreas	.30				

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TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item	Description of sample*	Preliminary treatment of sample; method; potency designation of impure standard (in italics)	Folic acid (mg./100 gm.)					Other assays	
			Microbiological assays						
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both		
			Moist basis	Moisture-free basis	Moist basis	Moisture-free basis	Moist basis		
(1)	(2)	(3)	(4a)	(4b)	(5a)	(5b)	(6a)	(7a)	(8)
Chicken—Con. Liver—Conti- nued	White leghorn chickens—Con.								
	Basal diet+0.40 mg. PGA per kg. diet; 9 chicks.	Autolysis pH 4.5..... Autolysis pH 7.0..... Hog kidney..... Chicken pancreas..... Autolysis pH 4.5.....	.29 .23 .29 .32 .85						
	Basal diet+0.80 mg. PGA per kg. diet; 9 chicks.	Autolysis pH 7.0..... Hog kidney..... Chicken pancreas..... Autolysis pH 4.5.....	.87 .99 .86 .50						
	Basal diet+2.00 gm. PGA per kg. diet; 9 chicks.	Autolysis pH 7.0..... Hog kidney..... Chicken pancreas..... Autolysis pH 4.5.....	.51 .60 .63 .77						
	Basal diet+10.00 mg. PGA per kg. diet; 8 chicks.	Autolysis pH 7.0..... Hog kidney..... Chicken pancreas..... Autolysis pH 4.5.....	.73 .78 .89 .67						
	Commercial feed contained 1.75 mg. PGA per kg.; 8 chicks.	Autolysis pH 7.0..... Hog kidney..... Chicken pancreas.....	.53 .73 .71						115
	White leghorn pullets; 4 chicks each:								
	Basal diet contained 0.008 mg. PGA per kg.	Incubated pH 4.5.....	.20						
	Basal diet+0.25 mg. PGA per kg. diet.	do.....	.18						
	Basal diet+0.5 mg. PGA per kg. diet.	do.....	.25						
	Basal diet+0.75 mg. PGA per kg. diet.	do.....	.36						
	Basal diet+1.0 mg. PGA per kg. diet.	do.....	.32						
	Basal diet+1.25 mg. PGA per kg. diet.	do.....	.47						
	Basal diet+1.50 mg. PGA per kg. diet.	do.....	.33						
	Basal diet+2.0 mg. PGA per kg. diet.	do.....	.47						
	Basal diet+3.0 mg. PGA per kg. diet.	do.....	.42						
	Practical feed.....	do.....	.24						

White leghorn; 4 weeks old; germ-free chicks; 5 samples.	Takadiastase-papain; average and range		.21				97
White leghorn; 4 weeks old; control chicks; 5 samples.	do		.10-.30				
4 weeks old; control diet (PGA deficient ration+0.50 mg. PGA per kg.):			.19				
Control diet; 12 chicks	Autolysis pH 4.5 18-20 hours 37° C.	.117					
Control diet+vitamin B ₁₂ ; 12 chicks.	do	.104					
Control diet+vitamin C; 12 chicks.	do	.242					
Control diet+sulfasuxidine; 12 chicks.	do	.138					
Control diet+sulfasuxidine+vitamin B ₁₂ ; 12 chicks.	do	.169					
Control diet+sulfasuxidine+vitamin C; 12 chicks.	do	.134					
4 weeks old; ration I (PGA deficient ration with other B vitamins increased):							
Ration I; 12 chicks	Autolysis pH 4.5 18-20 hours 37° C.	.109					
Ration I+vitamin B ₁₂ ; 12 chicks.	do	.079					
Ration I+vitamin C; 12 chicks.	do	.148					
Ration I+sulfasuxidine; 12 chicks.	do	.101					
Ration I+sulfasuxidine+vitamin B ₁₂ ; 12 chicks.	do	.074					
Ration I+sulfasuxidine+vitamin C; 12 chicks.	do	.164					
Ration I+0.50 mg. PGA per kg. ration; 12 chicks.	do	.117					
Ration I+0.50 mg. PGA per kg. ration+vitamin B ₁₂ ; 12 chicks.	do	.118					
Ration I+0.50 mg. PGA per kg. ration+vitamin C; 12 chicks.	do	.195					
Ration I+0.50 mg. PGA per kg. ration+sulfasuxidine; 12 chicks.	do	.156					
Ration I+0.50 mg. PGA per kg. ration+sulfasuxidine+vitamin B ₁₂ ; 12 chicks.	do	.213					
Ration I+0.50 mg. PGA per kg. ration+sulfasuxidine+vitamin C; 12 chicks.	do	.120					
4 weeks old; PGA deficient ration; 10 chicks.	do	.098					
4 weeks old; PGA deficient ration+0.020 mg. PGA injected; 10 chicks.	do	.231					
4 weeks old; PGA deficient ration+25 mg. vitamin C injected; 10 chicks.	do	.127					
Texas market; 2	Buffered; autoclaved; chicken pancreas		.3770	1.351			114

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 mg.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both				
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)			
C ⁷ 80	Chicken—Con. Muscle-----	Takadiastase; average and range-----	{ .005 .0042-.0069						87		
	White leghorn; 4 weeks old; PGA deficient basal ration; Basal ration; 6 chicks-----	do-----	.006								
	Basal ration+0.25 mg. PGA per kg. ration; 5 chicks.	do-----	.004-.007								
	Basal ration+1.00 mg. PGA kg. ration; 6 chicks.	do-----	.006								
	Basal ration+10.00 mg. PGA per kg. ration; 6 chicks.	do-----	.005-.008								
	White leghorn; 5 weeks on PGA deficient basal ration: Basal ration-----	do-----	.004								
	Basal ration+2.00 mg. PGA per kg. ration.	do-----	.003-.005								
	White leghorn; 4-5 weeks old, on PGA deficient basal ration +2.0 mg. PGA per kg. ration; 6 samples (2 each).	Averaged results from digestion with takadiastase and digestion with hog kidney; average and range.	{ .008 .004-.012								
	Dark meat; Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.									
	White meat; Texas market; 3	do-----									
Skin-----	White leghorn; 4-5 weeks old; PGA deficient basal ration+ 2.0 mg. PGA per kg. ration; 6 samples (2 each).	Averaged results from digestion with takadiastase and digestion with hog kidney; average and range.	{ .005 .005-.006						114		
	Washington, D. C., market:										
Chicory: Raw-----	2-----	Buffered; autoclaved; average and range	{ .0044 .0037-.0050						87		
	3-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0316 .0271-.0354	.632	.0280	.560	.0236-.0304				
Chinese cab- bage. See Cabbage, chinese.											
Chocolate-----	1 sample, 1 pound-----	Takadiastase-papain; 40,000----- [200,000]-----	.099 [.0198]	.100 [.02]					25		

Coconut:								
Meat-----	Texas market; 5-----	Buffered; autoclaved; chicken pancreas; average and range.			{ .0276 .0138-.0423	.045		{ 114
Dried meat-----	Cocos nucifera L.-----	Rat growth method-----					.05	{ 11
Milk-----						1.0003		{ 118
Codfish:								
Canned, strained-----							.015	{ 7
Coffee:								
Toasted grain-----	Coffea arabica L.; Cuban market.	Buffered; autoclaved; takadiastase; chicken pancreas.		0				{ 10
Collard:								
Raw-----	Texas A. and M. College Farm; 3.	Buffered; autoclaved; chicken pancreas; average and range.		{ .1018 .0858-.1133	.960			{ 114
Coriander:								
Raw-----	Cilantro (<i>Coriandrum sativum</i> L.)-----	Takadiastase-----	.007	.050				{ 50
Corn:								
Raw-----	Elote (<i>Zea mays L.</i>)-----	Takadiastase-----	.019	.052				{ 120
	Golden; high-quality sample-----	do-----	.067					
	Hog kidney-----	do-----	.070					
	Washington, D. C., market-----	Buffered; autoclaved; chicken pancreas	.0138		.0184			
	Washington, D. C., market: 2-----	Buffered; autoclaved; average and range	{ .0051 .0038-.0063		{ .0051 .0047-.0054			
	3 <i>S. faecalis</i> , 2 <i>L. casei</i> -----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0135 .0124-.0144	.059	{ .0093 .041			
	Aristogold; Texas A. and M. College Farm; 2.	do-----			{ .0133 .0131-.0135	.054		
	Golden Bantam; Texas market; 3.	do-----			{ .0699 .0653-.0775	.268		
	Honey June; Texas A. and M. College Farm; 2.	do-----			{ .0671 .0652-.0690	.359		{ 114
	Yellow Field Hybrid; Texas market; 4.	do-----			{ .0234 .0188-.0270	.102		
	Golden Bantam; Texas market; 2.	do-----			{ .0083 .0074-.0092	.039		
	Golden Bantam; Texas A. and M. College Farm; 2.	do-----			{ .0193 .0167-.0219	.054		
	Golden Cross Bantam; Texas A. and M. College Farm; 2.	do-----			{ .0284 .0266-.0301	.133		
	Ioana; Texas A. and M. College Farm; 2.	do-----			{ .0131 .0129-.0132	.059		
	Tendermost; Texas A. and M. College Farm; 3.	do-----			{ .0243 .0153-.0325	.148		
Canned-----	Yellow; solid and liquid; 10 samples, 60 cans.	Takadiastase; average and range	{ .0017 .0013-.0024	.0056 .0033-.0069				{ 59
Dry seed-----		Takadiastase-papain; 3, 100 [200, 000]-----		1.00 [.0155]				{ 20
	Maíz U (<i>Zea Mays L.</i>)-----	Takadiastase-----	.031	.034				{ 50
	Maíz Gto. 20 (<i>Zea Mays L.</i>)-----	do-----	.035	.038				
	Ground-----	Buffered; heated 3 minutes; hog kid- ney; method a.	.023		.022			{ 91
		Buffered; heated 3 minutes; hog kid- ney; method b.			.017			

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

¹ mg. per 100 ml.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis (7a)		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)			
Corn—Continued Dry seed—Continued	Feedstuff; 4 tests.....	Chick growth; average and range.....						{ .03 .008-.06	75	
	Yellow; feedstuff; 7 <i>S. faecalis</i> , 6 <i>L. casei</i> samples. 1948 crop; composite U. S. sample: 2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; hog kidney; aver- age and range.	{ .029 .022-.044		.023 .021-.029				41	
	4 <i>S. faecalis</i> , 5 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0055 .0044-.0065		.0045 .0037-.0051				114	
	1 sample.....	Buffered; autoclaved; takadiastase.....	.006		.009				90	
	5 samples.....	Buffered; heated 3 minutes; hog kid- ney; method a.	.009		.005				91	
		Buffered; heated 3 minutes; hog kid- ney; method b.								
		Buffered; autoclaved; hog kidney; average and range.	{ .009 .006-.012		.009 .007-.013				41	
	Washington, D. C., market: 1 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	.0033		{ .0022 .0019-.0025					
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0061 .0045-.0076	.006	.0050 .0033-.0070	.005				
	Corn and soy; Washington, D. C., market: 3 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0114 .0090-.0127		.0171 .0135-.0207				114	
	4.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0987 .0915-.1071	.101	.0616 .0510-.0700	.063				
Hominy grits	1 sample, 1 pound.....	Takadiastase-papain; 40,000..... [200,000].....	{ .010 [.002]	.011 [.0022]					25	
	Washington, D. C., market: 2.....	Buffered; autoclaved; average and range	.0029		.0021					
	6 <i>S. faecalis</i> , 8 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0024-.0034 .0045-.0049		.0018-.0024 .0038	.004			114	
Meal White.....	2 samples.....	Trace							61	
	1 sample, 1 pound.....	Takadiastase-papain; 40,000..... [200,000].....	{ .020 [.004]	.023 [.0046]					25	
	Washington, D. C., market: 3 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0023 .0016-.0030		.0016				114	

Yellow	4	Buffered; autoclaved; chicken pancreas; average and range.	{ .0100 .0084-.0117	.011	.0067 .0064-.0068	.007					
	Zea mays L.; Cuban market	Buffered; autoclaved; takadiastase; chicken pancreas.		0							
	do	do		0							
	do	do		0							
	Washington, D. C., market:										
	2 S. faecalis, 4 L. casei	Buffered; autoclaved; average and range	{ .0031 .0029-.0033		.0028 .0019-.0035						
	4	Buffered; autoclaved; chicken pancreas; average and range.	{ .0101 .0076-.0116	.011	.0064 .0055-.0073	.007					
Sprouted, dehydrated	Seed, shoot, and root	Takadiastase-papain; 3, 100 [200, 000]		4.50 [.0697]							
Cowpea. See Bean and bean products, cowpea.											
Cranberry: Raw	Washington, D. C., market:										
	1	Buffered; autoclaved	.0010		.0001						
	2	Buffered; autoclaved; chicken pancreas; average and range.	{ .0027 .0026-.0027	.021	.0017 .0015-.0018	.013					
Cucumber: Raw	Garden or retail sample	Water extract	.0023		.0026						
		Takadiastase	.0050		.0067						
		Hog kidney	.0065		.0125						
	Washington, D. C., market:										
	3	Buffered; autoclaved; average and range	{ .0039 .0028-.0046		.0037 .0026-.0044						
	2	Buffered; autoclaved; chicken pancreas; average and range.	{ .0076 .0073-.0079	.181	.0087 .0085-.0088	.207					
	Straight Eight; Texas market;										
	2	do			{ .0079 .0076-.0081	.188					
Custard apple, bullock's heart: Raw	Texas market; 2	do			{ .0035 .0029-.0040	.097					
	Annona reticulata L.	Rat growth method							<.02	11	
Date	Washington, D. C., market:										
	2	Buffered; autoclaved; average and range	{ .0089 .0071-.0106		.0110 .0103-.0116						
	4	Buffered; autoclaved; chicken pancreas; average and range.	{ .0245 .0232-.0265	.030	.0249 .0205-.0290	.030					
Dewberry: Raw	Regal Ness; Texas A. and M. College Farm; 2	do			{ .0308 .0308-.0308	.208					
	Earli Ness; Texas A. and M. College Farm; 2	do			{ .0276 .0270-.0283	.224					
	Texas market; 2	do			{ .0200 .0193-.0206	.132					
Dock: Raw	Lengua de vaca (<i>Rumex</i> Sp.)	Takadiastase	.031	.383							50

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)	
			Microbiological assays							
			S. faecalis (4a)		L. casei (4b)	Moist basis (5a)	Moisture-free basis (5b)	Moist basis (6a)		
			Moist basis (4a)	Moisture-free basis (4b)		Moist basis (5a)	Moisture-free basis (5b)	Moist basis (6a)		
Egg:										
Chicken.....	2 samples, 12 eggs.....	Takadiastase-papain; <i>40,000</i> ; average [200,000]..... <i>40,000</i> ; range..... [200,000].....	.086 [.0172] .076-.095 [.0152-.019]	.33 [.066]					25	
	1 sample.....	Takadiastase-papain; <i>40,000</i> [200,000].....	.110 [.022]						26	
White leghorn pullets:										
Basal diet 1 month.....		Takadiastase.....	.0067							
Basal diet 2 months.....		do.....	.012							
Supplemented diet 1 month.....		do.....	.0064							
Supplemented diet 2 months.....		do.....	.020							
Basal diet 1½ months.....		do.....	.008							
Basal diet 2½ months.....		do.....	.009							
Basal diet 3½ months.....		do.....	.008							
Basal diet 4½ months.....		do.....	.015							
Basal diet 5½ months.....		do.....	.008							
Basal diet 6½ months.....		do.....	.011							
Basal diet 7½ months.....		do.....	.011							
Supplemented diet 1½ months.....		do.....	.011							
Supplemented diet 2½ months.....		do.....	.016							
Supplemented diet 3½ months.....		do.....	.012							
Supplemented diet 4½ months.....		do.....	.017							
Supplemented diet 5½ months.....		do.....	.012							
Supplemented diet 6½ months.....		do.....	.013							
Supplemented diet 7½ months.....		do.....	.014							
1 sample, 48 eggs.....		Hog kidney.....	.027							
	do.....	do.....	.013							
	do.....	do.....	.018							
	do.....	do.....	.021							
	do.....	do.....	.017							
	do.....	do.....	.015							
	do.....	do.....	.018							
1 sample.....		{ Chicken pancreas.....	.0020							
		Hog kidney.....	.0033							
		{ Chicken pancreas; hog kidney.....	.0030							
		Chicken pancreas.....	.0063							
1 sample.....		Hog kidney.....	.0065							
		{ Chicken pancreas; hog kidney.....	.0060							
Agricultural Research Center; 6.		Buffered; autoclaved; chicken pancreas; average and range.	{ .0046 [.0041-.0050]	.018	.0032 .0019-.0059	.013				
Texas market; 3.....		do.....			{ .0075 .0065-.0081	.028			114	

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

⁴ Numerals used in column 2 for Reference No. 111-100-00000.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>						
			Moist basis (4a)	Moisture-free basis (4b)	Moist basis (5a)	Moisture-free basis (5b)	Moist basis (6a)				
Egg yolk—Con tinued Chicken—Co tinued	8 weeks on practical all mash feed; 4 hens.	Chicken pancreas; range.....			3 .072-.081						
	8 weeks on experimental diet including sucrose+0.800 mg. PGA per kg. diet; 4 hens.	Chicken pancreas.....			3 .087						
	8 weeks on experimental diet including sucrose+0.400 mg. PGA per kg. diet; 4 hens.	do.....			3 .037						
	8 weeks on experimental diet including sucrose+0.200 mg. PGA per kg. diet; 4 hens.	do.....			3 .033						
	8 weeks on experimental diet including sucrose.	do.....			3 .026						
	8 weeks on experimental diet including starch+0.400 mg. PGA per kg. diet; 4 hens.	do.....			3 .070						
	8 weeks on experimental diet including starch+0.200 mg. PGA per kg. diet; 4 hens.	do.....			3 .056						
	Single comb white leghorn pul lets; practical rations: All groups prior to experiment	(Whole egg boiled 5 minutes); taka -diastase. ⁴	.0162								
	Control group 4 pullets: First week.....	do.....	.0134								
	Second week.....	do.....	.0209								
	Fourth week.....	do.....	.0099								
	Sixth week.....	do.....	.0076								
	Eighth week.....	do.....	.0092								
	Tenth week.....	do.....	.0146								
	Single comb white leghorns; basal diet contained 0.008 mg. PGA per kg. diet; each group 4 pullets:										
	Basal diet; 1-8 weeks.....	(Whole egg boiled 5 minutes); taka -diastase. ⁴ range.	.0018-.0102								
	Basal diet+0.25 mg. PGA per kg. diet; 1-10 weeks.	do.....	.0023-.0166								
	Basal diet+0.50 mg. PGA per kg. diet; 1-10 weeks.	do.....	.0027-.0135								
	Basal diet+0.75 mg. PGA per kg. diet; 2-10 weeks.	do.....	.0044-.0151								

	Basal diet+1.0 mg. PGA per kg. diet; 1-10 weeks.	do	.0056-.0207	.	.	.	.	.	.	.	.	.	.	.	.
	Basal diet+1.25 mg. PGA per kg. diet; 1-10 weeks.	do	.0080-.0235	.	.	.	.	.	.	.	.	.	.	.	.
	Basal diet+1.50 mg. PGA per kg. diet; 1-10 weeks.	do	.0149-.0276	.	.	.	.	.	.	.	.	.	.	.	.
	Basal diet+2.0 mg. PGA per kg. diet; 1-10 weeks.	do	.0099-.0257	.	.	.	.	.	.	.	.	.	.	.	.
	Basal diet+3.0 mg. PGA per kg. diet; 1-10 weeks.	do	.0238-.0375	.	.	.	.	.	.	.	.	.	.	.	.
	Single comb white leghorns; basal diet contained 0.008 mg. PGA per kg. diet:														
	Basal diet+sucrose		Approx. .0035												112
	Basal diet+dextrin		Approx. .0065												114
	Agricultural Research Center; 7 <i>S. faecalis</i> , 5 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0127 .0090-.0148	.026	.0131 .0100-.0165	.027									114
Dried	1 sample	Untreated Chicken pancreas Hog kidney Chicken pancreas; hog kidney Buffered; autoclaved; chicken pancreas; specified method; average and range. Buffered; autoclaved; chicken pancreas or hog kidney; other than specified method; average and range.	{ .011 .052 .047 .055 .0997 .0526-.192 .146 .055-.390												107
	1948 A.O.A.C. collaborative assay.	Chick weight method; 3 laboratories; average and range. Chick hematocrit method; 1 laboratory Chick hemoglobin method; 1 laboratory Buffered; autoclaved; chicken pancreas Buffered; autoclaved Buffered; autoclaved; hog kidney Buffered; autoclaved; chicken pancreas Takadiastase													44
	Special sample			.048		.062									284 143-.43 14 17
Turkey	Low PGA diet														114
	Supplemented diet	do Autoclaved; incubated; average Incubated; average	.047 .0419 .0602												102
	Broad-breasted Bronze; 7 assays.	Autoclaved; chicken pancreas; average Chicken pancreas; average Inactivated chicken pancreas; average	.0629 .1297 .0608												29
Eggplant:	Raw	High-quality sample	Autolysis Takadiastase Hog kidney	0 0 0											120
	Washington, D. C., market: 2	Buffered; autoclaved; average and range	{ .0033 .0010-.0056		.0043 .0011-.0074										
	5 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0147 .0086-.0267	.186	.0146 .0111-.0204	.185									114
	Texas market; 3	do					{ .0048 .0040-.0053	.069							
	Texas market; 2	do					{ .0079 .0074-.0084	.108							

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

^a Estimated from graph. ^b Comparable results from hog kidney or chicken pancreas in preliminary studies noted by authors.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
(1)	(2)	(3)	Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	(6a)	Moist basis (7a)	(8)	
Endive: Raw-----	1 sample-----	Buffered; heated 3 minutes; incubated pH 4.5.	.017						91	
		Buffered; heated 3 minutes; takadiastase.	.018							
		Buffered; heated 3 minutes; hog kidney.	.090							
		Autolyzed in water.	.046							
		Incubated pH 4.5.	.037							
		Takadiastase.	.035							
		Takadiastase (corrected for conjugate content of takadiastase).	(.029)							
	Garden or greenhouse; 4 samples. Garden or greenhouse sample-----	Hog kidney.	.087						41	
		Buffered; heated 3 minutes; hog kidney; average and range.	{ .075 .066-.089	{ .79 .63-.80	{ .062 .050-.075	{ .65 .56-.75				
		Buffered; heated 3 minutes; hog kidney.		.630		.710				
		Stored in a wax bag:								
		1 day at room temperature.	do	.520		.660				
		2 days at room temperature	do	.380		.490				
		3 days at room temperature	do	.180		.260				
		1 day in refrigerator.	do	.490		.470				
	Broadleaf; Texas market; 2-----	2 days in refrigerator.	do	.650		.580			114	
		1 week in crushed ice.	do	.670		.630				
		2 weeks in crushed ice.	do	.760		.610				
		White curled; Texas market; 2-----	Buffered; autoclaved; chicken pancreas; average and range.			{ .0637 .0619-.0654	{ 1.249 -----			
		Green curled; Texas A. and M. College Farm; 2.	do			{ .0268 .0247-.0288	{ .419 -----			
		Escarole: Raw-----	Texas market; 2-----	do		{ .0495 .0478-.0512	{ .669 -----			
		Fat, hydro- genated-----	4-----	do	Not measurable	{ .00004 .00000-.00008				
		Fig-----	Texas market; 4-----	do		{ .0067 .0049-.0088	{ .039 -----			
		Dried-----	Composite of several brands:							
		1-----	Buffered; autoclaved.	.0052		.0032				
		4 <i>S. faecalis</i> , 2 <i>L. casei</i> -----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0146 .0117-.0179	{ .019 -----	{ .0074 -----	{ .010 -----			
		Filbert-----	Washington, D. C., market; 7 <i>S. faecalis</i> , 6 <i>L. casei</i> .	do	{ .0711 .0555-.0887	{ .074 -----	{ .0621 .0550-.0680	{ .064 -----		

Fish:						
Raw.		Takadiastase-papain; 40,000 [200,000]	.164 [.0328]			
Dried.	Charales.	Takadiastase	.052	.055		
Flaxseed	1948 crop; composite U. S. sample: 2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0241 .0183-.0298		.0174 .0153-.0200	
	4 <i>S. faecalis</i> , 5 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0470 .0368-.0534	.050	.0467 .0316-.0730	.050
Flour. See Wheat, Rye, etc.						
Fruit, mixed:						
Dried.	Fruit cake mixture: 1 6 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved	.0004		.0001	
		Buffered; autoclaved; chicken pancreas; average and range.	{ .0018 .0009-.0034	.002	.0013 .0010-.0016	.002
Goosefoot:						
Raw.	Epazote (<i>Chenopodium ambrosioides</i> L.). Huauzontle (<i>Chenopodium nuttallie</i> Saff.). Quelite cenizo (<i>Chenopodium mexicanum</i> Moq.).	Takadiastase	.023	.241		
		do	.058	.207		
		do	.094	.562		
Grape:						
Raw.		Buffered; heated 45 minutes (abstract); chemical method.				
Green.	Washington, D. C., market: 2	Buffered; autoclaved; average and range	{ .0018 .0017-.0018		.0010 .0009-.0011	
	3 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0050 .0046-.0054	.026	.0050 .0043-.0057	.026
	Texas market; 4	do			{ .0043 .0034-.0048	.019
Red.	Washington, D. C., market: 2	Buffered; autoclaved; average and range	{ .0032 .0031-.0033		.0030 .0029-.0031	
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0064 .0060-.0068	.034	.0054 .0046-.0061	.029
	Texas market; 2	do			{ .0028 .0026-.0030	.015
Grapefruit:						
Raw.	1 sample, 4 specimens	Takadiastase-papain; 40,000 [200,000]	.055 [.011]	.49 [.098]		
	Washington, D. C., market: 1	Buffered; autoclaved	.0015		.0014	
	2	Buffered; autoclaved; chicken pancreas; average and range.	{ .0028 .0026-.0029	.028	.0022 .0020-.0023	.022
	Washington, D. C., market	Buffered; autoclaved; chicken pancreas	.00276		.00256	
	Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			{ .0033 .0023-.0042	.026

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis (7a)		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)			
Grapefruit—Canned, sweetened 89	Grapefruit—Canned, sweetened Solid and liquid: Duncan; 1,000 field boxes; plant O.	Autoclaved 1 hour pH 7.2			.0009	.0060				
	Duplicate	do			.0011	.0070				
	Seeded; 750 field boxes; plant H.	do			.0006	.0036				
	Replicate	do			.0009	.0053				
	Replicate	do			.0008	.0044				
	Duncan; 600 field boxes; plant P.	do			.0006	.0039				
	Duncan; 600 field boxes; plant B.	do			.0008	.0047				
	Duplicate	do			.0009	.0057				
	Duncan; 252 field boxes; plant Q.	do			.0011	.0077				
	Duncan; 297 field boxes; plant Q.	do			.0013	.0084				
	Grapefruit juice: Raw	Duncan; 3,600 field boxes; plant E.	Autoclaved 1 hour pH 7.2		1.0018				67	
	20 percent Marsh Seedless, 80 percent Duncan; 2,500 field boxes; plant L.	do			1.0008					
Canned 59	50 percent Marsh Seedless, 50 percent Duncan; 4,500 field boxes; plant B.	do			1.0008					
	50 percent Marsh Seedless, 50 percent Duncan; 900 field boxes; plant F.	do			1.0009					
	33 percent Marsh Seedless, 67 percent Duncan; 4,500 field boxes; plant J.	do			1.0008					
	Seeded; 1,800 field boxes; plant H.	do			1.0009					
	11 samples, 66 cans	Takadiastase; average and range	{ .0005 .0003-.0007		.0012 .0010-.0016					
	Duncan; 3,600 field boxes; plant E.	Autoclaved 1 hour pH 7.2			1.0022					
	20 percent Marsh Seedless, 80 percent Duncan; 2,500 field boxes; plant L.	do			1.0019					

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

¹ mg. per 100 ml.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Kohlrabi: Raw-----	Garden or retail sample-----	Takadiastase-----	.007						90	
	Garden or greenhouse; 2 samples.	Buffered; heated 3 minutes; hog kidney; average and range.	{ .052 .048-.056	.555 .47-.64	.050 .043-.056 .0101 .0083-.0119	.52 .49-.55 .052				
	Texas market; 2-----	Buffered; autoclaved; chicken pancreas; average and range.								
Lamb and mutton: Leg-----	All visible fat removed; 1 sample, 1 specimen.	Takadiastase-papain; 40,000 [200,000]-----	.11 [.022]	.36 [.072]					25	
		Takadiastase-----	.012		.011					
		do-----	.0082		.0064					
Liver-----	Texas A. and M. College Animal Husbandry; 2.	Buffered; autoclaved; chicken pancreas; average and range.			.0033	.012			103	
		do-----			.0032-.0034					
					.2760	.905				
Shoulder-----	1 sample, 4 specimens-----	Takadiastase-papain; 40,000 [200,000]-----	.077 [.0154]	.18 [.036]					25	
		Takadiastase-----	.0082		.0068					
					.0082	.026				
Stew meat-----	Texas A. and M. College Animal Husbandry; 2.	Buffered; autoclaved; chicken pancreas; average and range.			.0074-.0090				103	
	Washington, D. C., market:									
	4-----	Buffered; autoclaved; average and range	{ .0004 .0002-.0005		.0005					
Lemon: Raw-----	14-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0013 .0003-.0022	.003	.0025	.006			114	
	Washington, D. C., market:	Buffered; autoclaved; average and range	{ .0024 .0018-.0029		.0025					
	3-----				.0016-.0043					
Lentil: Dry seed-----	5-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0063 .0042-.0102	.070	.0078	.087			114	
	Washington, D. C., market-----	Buffered; autoclaved; chicken pancreas	.00397		.0041-.0120					
					.00454					
Lettuce: Raw-----	Lenteja (<i>Ervum lens</i> L.)-----	Takadiastase-----	.083	.093					50	
	Composite of several brands:									
	4 <i>S. faecalis</i> , 2 <i>L. casei</i> -----	Buffered; autoclaved; average and range	{ .0259 .0142-.0411		.0230					
Lettuce: Raw-----	5-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .1010 .0852-.1123	.111	.0990	.108			114	
	1 sample, 1 specimen-----	Takadiastase-papain; 40,000 [200,000]-----	.038 [.0076]	.73 [.146]						
	Lechuga (<i>Lactuca sativa</i> L.)-----	Takadiastase-----	.010	.202						

	High-quality sample.....	.004 .023 Buffered; heated 3 minutes; autolysis pH 4.5. Buffered; heated 3 minutes; takadiastase.	.024 .038					120
1 sample.....	Buffered; heated 3 minutes; hog kidney Buffered; heated 3 minutes; takadiastase; hog kidney. Buffered; heated 3 minutes; hog kidney; takadiastase. Autolysis pH 4.5.....	.050 .052 .052 .050	.060 .060 .068					
	Takadiastase.....	.050						
	Hog kidney.....	.083						
	Takadiastase; hog kidney.....	.077						
1 sample.....	Buffered; heated 3 minutes; autolysis pH 4.5. Buffered; heated 3 minutes; takadiastase. Buffered; heated 3 minutes; hog kidney Buffered; heated 3 minutes; takadiastase; hog kidney. Buffered; heated 3 minutes; incubated pH 4.5. Buffered; heated 3 minutes; takadiastase.		.025 .030 .076 .082 .018 .019					91
1 sample.....	Buffered; heated 3 minutes; hog kidney Autolyzed in water.....	.140 .041						
	Incubated pH 4.5.....	.039						
	Takadiastase.....	.051						
	Takadiastase (corrected for conjugate content of takadiastase). Hog kidney.....	(.045) .140						
	Water extract; mild heat; chemical method.		.046				.058	5
Lactuca sativa L.....	Rat growth method.....						.10	11
	Buffered; heated 45 minutes (abstract); chemical method.						.15	
Head.....	Iceberg; Texas market; 2.....			.0039 .0025-.0053	.098			
	do.....			.0028 .0023-.0032	.065			
	Iceberg; Texas market; 4.....			.0108 .0103-.0115	.257			
	Boston, immature; Washington, D. C., market: 1.....	Buffered; autoclaved.....	.0044	.0126				
	2.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0421 .0348-.0493	.810 .0390	.750			114
	Boston; Washington, D. C., market: 1.....	Buffered; autoclaved.....	.0026	.0031				
	3.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0109 .0108-.0109	.287 .0112	.295			
	Iceberg; Washington, D. C., market: 2.....	Buffered; autoclaved; average and range	{ .0023 .0021-.0025	.0041 .0036-.0045				

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
(1)	(2)	(3)	(4a)	(4b)	(5a)	(5b)	(6a)	(7a)	(8)	
Lettuce—Con. Head—Continued Iceberg; D. C. market—Con.	5-----	Buffered; autoclaved; chicken pancreas; average and range. Takadiastase.....	.0098 .0086-.0112	.228	.0103 .0085-.0135	.240			114	
Leaf-----	Garden or retail sample----- do-----	Water extract..... Acid hydrolysis..... Alkaline hydrolysis..... Takadiastase.....	.007 .009 .005 .008		.012 .004 .016				90	
	Garden or greenhouse; 4 samples.	Buffered; heated 3 minutes; hog kidney; average and range.	.084 .058-.140	1.03 .93-.1.23	.069 .047-.110	.85 .68-.97				
	Garden or greenhouse sample----- Stored in a wax bag: 1 day at room temperature 2 days at room temperature 1 week in refrigerator 1 week in crushed ice	Buffered; heated 3 minutes; hog kidney		1.000		.900			41	
		1 day at room temperature 2 days at room temperature 1 week in refrigerator 1 week in crushed ice		1.000 .900 1.500 2.000		1.000 .800 1.200 1.500				
	Garden or greenhouse sample----- Stored in a wax bag: 1 day at room temperature 2 days at room temperature 1 week in refrigerator 1 week in crushed ice	1 day at room temperature 2 days at room temperature 1 week in refrigerator 1 week in crushed ice		.900		.900				
	Oakleaf; Texas market; 3-----	Buffered; autoclaved; chicken pancreas; average and range.		1.300		1.100				
	Texas market; 2-----	do-----			.0543 .0521-.0556	.835				
	Black Seeded Simpson; Texas A. and M. College Farm; 2.	do-----			.0165 .0151-.0179	.434				
	Oakleaf; Texas market; 2-----	do-----			.0450 .0436-.0464	.584				
					.0584 .0521-.0647	1.043				
Lima beans. See Beans, lima.									114	
Limes: Raw-----	Washington, D. C., market: 2----- 3-----	Buffered; autoclaved; average and range Buffered; autoclaved; chicken pancreas; average and range.	.0025 .0022-.0027		.0026 .0016-.0035					
	Washington, D. C., market-----	Buffered; autoclaved; chicken pancreas	.00390	.036	.0056 .0040-.0070	.054				
					.00439					

Mackerel:							
Canned-----	Atlantic (<i>Scomber scombrus</i>); drained solids:						
	Sample No. 1, 12 cans-----	Hog pancreas-----			.0012		
	do-----	do-----			.0022		
	Duplicate-----	do-----			.0009		
	Sample No. 3, 12 cans-----	do-----			.0013		
	Duplicate-----	do-----			.0013		
	Sample No. 4, 12 cans-----	do-----			.0010		
	Duplicate-----	do-----			.0015		
	Pacific; drained solids; 1 sample, 12 cans.	do-----			.0006		
Mallow:							
Raw-----	Malva (<i>Malva sp.</i>)-----	Takadiastase-----	.240	1.010			50
Mango:							
Raw-----	Mango amarillo variety (<i>Mangifera indica</i> , L.) (<i>Mangifera indica</i> L.)-----	Buffered; autoclaved; takadiastase; chicken pancreas.			0		10
Melon:							
Raw-----		Rat growth method-----					.02
Milk:							
Cow:		Autolysis; 40,000-----	1.002				
Fluid:		[200,000]-----	[1.0004]				
Whole	1 sample-----	Autoclaved 30 minutes; 40,000-----	1.001				
		[200,000]-----	[1.0002]				
		Takadiastase-papain; 40,000; (uncorrected for vitamin in enzymes).-----	1.006				
		[200,000]-----	[1.0012]				
		Takadiastase-papain; 40,000 (corrected for vitamin in enzymes).-----	Negative				
	Jersey and Guernsey; 15 samples.	Takadiastase-papain; 40,000; average [200,000]-----	1<.005 [1<.001]	1<.04 [1<.008]			
		40,000; range-----	1<.001-<.005				
		[200,000]-----	[1<.0002-<.001]				
	2 samples-----	Hog kidney-----	Nil-trace				
	12 samples-----	Chicken pancreas, 1 hour at 45° C.; average and range-----	1.00016 1.00009-.00024	1.0024 1.0011-.0074			61
	Pasteurized-----	Hog kidney-----	1.00004				
	Mature milk-----						81
	do-----					1.00067	
	do-----					1.00064	
	do-----					1.00061	
	do-----					1.00060	
	do-----					1.00059	
	do-----					1.00058	
	do-----					1.00058	
	do-----					1.00045	
	do-----					1.00039	
	do-----					1.00034	
	do-----					1.00032	
	do-----					1.00031	
	do-----					1.00023	
	do-----					1.00021	
	do-----					1.00020	
	do-----					1.00020	
	do-----					1.00019	

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples. ¹ mg. per 100 ml.
⁵ Communication from F. M. Strong. ⁶ Communication from Icie Macy Hoobler.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays									
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both					
(4a)	(4b)	(5a)	(5b)	(6a)								
Milk—Continued												
Cow—Continued												
Fluid—Continued												
Whole—Continued												
Mature milk—Continued												
do.												
do.												
do.												
do.												
do.												
do.												
do.												
do.												
do.												
do.												
do.												
do.												
do.												
Above 32 samples of mature milk.	Average and range											
Guernsey; 1 cow; postpartum:												
0 days	No treatment	1.00075										
1 day	do	1.00020										
2 days	do	1.00011										
4 days	do	1.00010										
5 days	do	1.00012										
6 days	do	1.00010										
2 weeks	do	1.00011										
3 weeks	do	1.00016										
4 weeks	do	1.00010										
6 weeks	do	1.00045										
8 weeks	do	1.00035										
10 weeks	do	1.00018										
Holstein; 4 cows:												
1st week	No treatment; average and range	{ 1.00015 { 1.00010-.00027										
2nd week	do	{ 1.000060 { 1.000055-.000070										
3rd week	do	{ 1.00016 { 1.00006-.00040										

	Guernsey; 4 cows:							
	1st week	do	{ 1. 00021 1. 00013-. 00035					
	2nd week	do	{ 1. 00011 1. 00007-. 00018					
	3rd week	do	{ 1. 00018 1. 00010-. 00028					
	Jersey; 4 cows:							
	1st week	do	{ 1. 00010 1. 00006-. 00014					
	2nd week	do	{ 1. 00005 1. 00002-. 00010					
	3rd week	do	{ 1. 00012 1. 00008-. 00018					
	Commercial, pasteurized; 6 samples.	do	{ 1. 00026 1. 00015-. 00050					
	Texas A. and M. College Creamery; 3.	Buffered; autoclaved; chicken pancreas; average and range. (Autoclaved; 40,000 [200,000]) Takadiastase-papain; 40,000 (uncorrected for vitamin in enzymes). [200,000]		{ . 0006 . 0003-. 0009	. 005			114
Nonfat..	1 sample		{ 1. 011 1. 0022 1. 016 [1. 0032]					124
		Takadiastase-papain; 40,000 (corrected for vitamin in enzymes). [200,000]	{ 1. 008					
		No treatment .....	. 0009		. 0007			
		pH 4 autoclaved 12 hours .....	. 0006					
		0.1 N KOH autoclaved 1 hour .....	. 0008					
		2 N KOH autoclaved 30 minutes	<. 0004					
		Takadiastase .....	. 0005					
		Chicken pancreas .....	. 0004					
	Rat method						(?)	37
Canned, evapo- rated..	10	Buffered; autoclaved; chicken pancreas; average and range.	{ . 0022 . 0003-. 0039	. 008	. 0007	. 003		114
Dried: Whole ..	1 sample	{ Takadiastase .....	. 0021		. 0016			131
		Semipure conjugase .....	. 0060		. 0048		(*)	55
		Chick methods						
		Hog kidney	Nil					
	5 samples	do	Nil-trace					61
	1 sample	{ Takadiastase	Nil					
		0.1 N HCl autoclaved	Nil					
		Sodium acetate autoclaved	Nil					
		Rat growth method .....					. 05	11
		Rat method					(*)	37
Nonfat..	Feedstuff; 3 tests	Chick growth method; average and range.					{ . 06 . 05-. 07	75
	Special sample; 3	Microbiological and chick assays					Much higher	46
Recon- stituted..	Evaporated milk reconstituted; 52 samples.	Buffered; autoclaved; chicken pancreas; average and range.	{ . 0034 . 0025-. 0039	. 003	. 0024	. 002	. 01	114
		Chicken pancreas incubated 1 hour 45° C. average and range.	{ 1. 00016 1. 00008-. 00033		1. 0013			55
					1. 0002-. 0029			

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples. ¹ mg. per 100 ml.

⁶ Communication from Icie Macy Hoobler. ⁷ The results are interpreted as further evidence of a low concentration of folic acid in evaporated and dried milk.

⁸ Methods not sensitive enough to assay milk. Appears to give results higher than those given by *S. faecalis* or *L. casei*.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both				
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)			
Milk—Continued Cow—Continued Reconstituted—Continued	Evaporated milk reconstituted:										
	Sample No. 1.....	Not treated..... Chicken pancreas incubated 1 hour 45° C.	1.00021 1.00027		1.0016 1.0023						
	Sample No. 2.....	Not treated..... Chicken pancreas incubated 1 hour 45° C.	1.00008 1.00012		1.0009 1.0015						
	Sample No. 3.....	Not treated..... Chicken pancreas incubated 1 hour 45° C.	1.00007 1.00009		1.0004 1.0004						
	Sample No. 4.....	Not treated..... Chicken pancreas incubated 1 hour 45° C.	1.00013 1.00020		1.0016 1.0016						
	Sample No. 5.....	Not treated..... Chicken pancreas incubated 1 hour 45° C.	1.00011 1.00012		1.0018 1.0018				55		
	Sample No. 6.....	Not treated..... Chicken pancreas incubated 1 hour 45° C. Hog kidney..... do.....	1.00014 1.00018 1.0003 1.0002		1.0010 1.0014						
	Evaporated milk reconstituted..... Dried milk reconstituted..... Nonfat dry milk reconstituted; 11 samples.	Chicken pancreas incubated 1 hour 45° C.; average and range.	1.00014 1.00007-.00022		1.0018 1.0013-.0026				81		
	Dry infant food reconstituted; brand 1.	Hog kidney.....	1.0003						55		
	Dry infant food reconstituted; brand 2.	do.....	1.0003						81		
Goat: Whole.....	4 samples.....	Takadiastase-papain; 40,000; average [200,000]..... 40,000; range..... [200,000].....	1<.003 [1<.0006] 1<.001-<.003 [1<.0002-<.0006]						124		
	7 samples stored 4° C (toluene): 0 days.....	No treatment; average and range.....	1.00012 1.00006-.00020								
	7 days.....	do.....	1.00086 1.00027-.00170								
	14 days.....	do.....	1.00089 1.00050-.00150								
	21 days.....	do.....	1.00094 1.00019-.00320								

	28 days	do	{ 1.00088 1.00026- .00240}						27
Saanen goats; postpartum:									
4 weeks, 7 goats	do		{ 1.00027 1.00012- .00050}						
6 weeks, 7 goats	do		{ 1.00018 1.00006- .00035}						
8 weeks, 7 goats	do		{ 1.00023 1.00008- .00042}						
10 weeks, 4 goats	do		{ 1.00042 1.00012- .00057}						
Reconstituted Human	Evaporated milk reconstituted.	Hog kidney	1.0002						81
Subject No. 407:									
3rd day	Takadiastase-papain; 40,000	[200,000]	1.050 [1.010]						
5th day	Takadiastase-papain; 40,000	[200,000]	1.044 [1.0088]						
8th day	Takadiastase-papain; 40,000	[200,000]	1.045 [1.009]						
Subject No. 410:									
3rd day	Takadiastase-papain; 40,000	[200,000]	1.046 [1.0092]						
5th day	Takadiastase-papain; 40,000	[200,000]	1.047 [1.0094]						
8th day	Takadiastase-papain; 40,000	[200,000]	1.048 [1.0096]						
Subject No. 401, 10th day	Takadiastase-papain; 40,000	[200,000]	1.033 [1.0066]						
Subject No. 27, 20th day	Takadiastase-papain; 40,000	[200,000]	1.044 [1.0088]						
Mature milk									
do								1.00036	
do								1.00032	
do								1.00031	
do								1.00031	
do								1.00030	
do								1.00028	
do								1.00026	
do								1.00023	
do								1.00020	
do								1.00020	
do								1.00020	
do								1.00020	
do								1.00019	
do								1.00017	
do								1.00016	
do								1.00016	
do								1.00015	
do								1.00015	
do								1.00014	
do								1.00014	
Above 22 samples (15 days to 15 months).	Average and range							{ 1.00022 1.00014- .00036}	77
Fresh	Hog kidney	1.0003							
Boiled (same lot as fresh)	do	1.0003							81

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples. ¹ mg. per 100 ml.

⁶ Communication from Icie Macy Hoobler.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Milk—Continued										
Human—Continued										
Subject No. 1; postpartum:										
3 days.....	No treatment.....		1.000030							
4 days.....	do.....		1.000010							
5 days.....	do.....		1.000030							
6 days.....	do.....		1.000015							
7 days.....	do.....		1.000025							
Subject No. 2; 4 days post- partum.	do.....		1.000015							
Subject No. 2; 5 days post- partum.	do.....		1.000050							
Subject No. 3; 3 days post- partum.	do.....		No measurable quantity							
Subject No. 3; 4 days post- partum.	do.....		1.000025							
Subject No. 3; 5 days post- partum.	do.....		No measurable quantity							
Subject No. 4; 3 days post- partum.	do.....		No measurable quantity							
Subject No. 4; 4 days post- partum.	do.....		1.000050							
Subject No. 5; 4 days post- partum.	do.....		1.000025							
Subject No. 5; 19 days post- partum.	do.....		1.000015							
Subject No. 5; 20 days post- partum.	do.....		1.000090							
Subject No. 5; 21 days post- partum.	do.....		1.000018							
Sheep.....	80-100 days postpartum; 9 sheep.	No treatment; average and range.....	{ 1.00022 1.0008- 0.0056							
Molasses:										
Cane.....	1 sample.....	Takadiastase-papain; 40,000..... [200,000].....	.0095 [.0019]	.013 [.0026]					25	
	High-test.....	Takadiastase.....	.0015						101	
	Blackstrap.....	do.....	.0038						53	
Beet.....	Blackstrap; 6 samples.....	Takadiastase.....	.021					.0043	101	
Mombin:										
Raw.....	Ciruela Mexicana (<i>Spondias lu-</i> <i>tea L.</i>).....	do.....	.019	.066					50	

Mushroom: Raw	1 sample, 3 specimens	Takadiastase-papain; 40,000 [200,000]	.098 [.01916]	.78 [.156]					25
	Washington, D. C., market: 3 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	.0202 .0140-.0259		.0208 .0183-.0232				
	5 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	.0304 .0272-.0330	.366	.0276 .0232-.0310	.333			114
	Texas market; 4	do			.0141 .0134-.0155	.172			
Mustard greens: Raw	High-quality sample	Autolysis	.032						120
		Takadiastase	.023						
		Hog kidney	.062						
	Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			.0377 .0354-.0399	.460			114
	do	do			.0169 .0140-.0197	.225			
Dried	1 sample	Untreated	.097						107
		Chicken pancreas	.455						
		Hog kidney	.410						
		Chicken pancreas; hog kidney	.475						
		Buffered; autoclaved; chicken pancreas; specified method; average and range.	.877 .513-1.110		.854 .657-1.038				
		Buffered; autoclaved; chicken pancreas or hog kidney; other than specified method; average and range.	.921 .480-1.240		.831 .650-1.093				
	1948 A.O.A.C. collaborative as- say	Chick growth method; 4 laboratories; average and range.						1.2	
		Chick thymus weight method; 1 labora- tory.							
		Chick hematocrit method; 2 labora- tories.							
		Chick total cell count method; 1 labora- tory.							
		Chick hemoglobin method; 1 laboratory							
	1949 A.O.A.C. collaborative as- say. (1948 sample stored at 10° F.)	Buffered; autoclaved; chicken pancreas; specified method; average and range.	.927 .735-1.13		.944 .685-1.174				
		Buffered; autoclaved; chicken pancreas or other treatment; other than speci- fied method; average and range.	.948 .75-1.13		1.32 1.32				
	Special sample; 2	Buffered; autoclaved; chicken pancreas; average.		1.050		.800			44
	do	do		.874		.880			
		Buffered; autoclaved	.128						
		Buffered; autoclaved; hog kidney	.493						
		Buffered; autoclaved; chicken pancreas	1.047						
Nectarines: Raw	Texas market; 3	Buffered; autoclaved; chicken pancreas; average and range.			.0201 .0129-.0271	.131			114
Nettle: Raw	Blind	Buffered; heated 45 minutes (abstract); chemical method.							475
	Hot	do							584
Oat: Whole grain	Takadiastase-papain; 3,100 [200,000]			2.20 [.0341]					8
									20

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples. 1 mg. per 100 ml.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays									
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both					
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)				
Oat—Con. Whole grain	Continued											
	Avena (<i>Avena sativa</i> L.) 2 samples	Takadiastase.....	.040	.043						50		
		Hog kidney.....	Trace							61		
		Buffered; heated 45 minutes (abstract); chemical method.							.14	8		
	Ground	Buffered; autoclaved pH 4.5.....	.019							91		
		Buffered; autoclaved; hog kidney.....	.055							41		
		Buffered; autoclaved; chicken pancreas.....	.053							75		
	Feedstuff; 7 samples	Buffered; autoclaved; hog kidney; aver- age and range.	{ .040		.034							
		Chick growth; average and range.....	{ .028-.055		.026-.054							
	Feedstuff; 3 tests								.02			
									{ .00-.05			
	White; 1948 crop; composite U. S. sample:											
	2	Buffered; autoclaved; average and range	{ .0267		.0133							
			{ .0261-.0273		.0069-.0196							
	4 <i>S. faecalis</i> , 5 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0557	.062	.0235	.026				114		
			{ .0454-.0663		.0160-.0263							
Breakfast cereal	Hulled; 3 samples	Buffered; autoclaved; hog kidney; aver- age and range.	{ .050		.040					41		
	Meal:		{ .032-.059		.030-.046							
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0091		.0064							
			{ .0061-.0121		.0046-.0092							
	4	Buffered; autoclaved; chicken pancreas; average and range.	{ .0312	.034	.0298	.032						
			{ .0208-.0396		.0275-.0312							
	Meal; infant food:											
	2 <i>S. faecalis</i> , 1 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0192		.0156							
			{ .0188-.0195									
	4	Buffered; autoclaved; chicken pancreas; average and range.	{ .0476	.050	.0388	.041				114		
			{ .0429-.0547		.0385-.0395							
	Ready-to-eat:											
	1	Buffered; autoclaved.....	.0066		.0059							
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0222	.023	.0227	.024						
			{ .0215-.0228		.0216-.0250							
Sprouted		Buffered; heated 45 minutes (abstract); chemical method.							.594	8		
Sprouted, de- hydrated		Takadiastase-papain; 3, 100 [200,000]		14.30						20		
				[.17165]								
Okra: Raw	1 sample, 10 specimens	Takadiastase-papain; 40, 000 [200,000]	.053	.52						25		
			[.0106]	[.104]								

	High-quality sample	Takadiastase	.037						120
	<i>Abelmoschus esculentus</i> L.	Hog kidney	.066					< .02	11
	Texas market; 4	Rat growth method							
	Clemson Spine; Texas A. and M. College Farm; 3.	Buffered; autoclaved; chicken pancreas; average and range.			.0289 .0245-.0307 .0192 .0117-.0276	.283 .229			114
Onion and various parts:	Raw	do							
	1 sample, 5 specimens	Takadiastase-papain; 40,000 [200,000]	.013 [.0026]	.11 [.022]					25
	<i>Cebolla (Allium cepa</i> L.)	Takadiastase	.005	.049					50
	Mature; Washington, D. C., market; 6.	Buffered; autoclaved; chicken pancreas; average and range.	{ .0070 .0061-.0081	.064	.0120 .0093-.0155	.109			
	Green, bottoms; Washington, D. C., market; 1	Buffered; autoclaved	.0039		.0041				
	5	Buffered; autoclaved; chicken pancreas; average and range.	{ .0098 .0088-.0110	.103	.0140 .0078-.0200	.147			
	Green, tops; Washington, D. C., market; 5.	do	{ .0136 .0098-.0223	.247	.0154 .0136-.0200	.280			
	Spring	Buffered; autoclaved	.0090						114
		Buffered; autoclaved; takadiastase	.0110						
		Buffered; autoclaved; hog kidney	.0090						
	Yellow Bermuda; Texas market; 2.	Buffered; autoclaved; chicken pancreas; average and range.			{ .0060 .0053-.0067	.079			
	Green; Texas market; 2	do			{ .0126 .0113-.0138	.152			
	Texas market; 2	do			{ .0141 .0108-.0173	.191			
Orange:	Raw	1 sample, 6 specimens	Takadiastase-papain; 40,000 [200,000]	.083 [.0166]	.65 [.13]				25
	Washington, D. C., market; 3	Buffered; autoclaved; average and range	{ .0024 .0018-.0029		.0025 .0013-.0044				
	5	Buffered; autoclaved; chicken pancreas; average and range.	{ .0045 .0036-.0055	.033	.0055 .0040-.0076	.040			114
	Washington, D. C., market	Buffered; autoclaved; chicken pancreas	.00425		.00572				
	Valencia; Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			{ .0047 .0043-.0052	.028			
Canned, sweetened.	Valencia; 308 field boxes	Autoclaved 1 hour pH 7.2			.0032	.0206			67
Orange juice:	Raw	1 sample	(No treatment pH 4 autoclaved 12 hours 0.1 N KOH autoclaved 1 hour 2 N KOH autoclaved 30 minutes Takadiastase Chicken pancreas)	<.004 .010 <.004 <.004 .020 <.004	<.004 <.004 <.004 <.004 .030 <.004				76
	Valencia	pH 7.2 autoclaved 1 hour				.0024			
	Frozen 1 month	do				.0022			
	Frozen 2 months	do				.0020			
	Frozen 4 months	do				.0026			
	Frozen 6 months	do				.0027			
	Frozen 8 months	do				.0029			

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

¹ mg. per 100 ml.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
(1)	(2)	(3)	Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Orange juice— Raw—Continued	Continued									
	Valencia:									
	1,500 field boxes; plant A.....	pH 7.2 autoclaved 1 hour—Continued.								
	4,500 field boxes; plant B.....	do.....								
	2,400 field boxes; plant C.....	do.....								
	1,800 field boxes; plant D.....	do.....								
	3,000 field boxes; plant E.....	do.....								
	1,800 field boxes; plant F.....	do.....								
	3,000 field boxes; plant G.....	do.....								
	2,400 field boxes; plant H.....	do.....								
	250 field boxes; plant I.....	do.....								
	2,000 field boxes; plant J.....	do.....								
	2,143 field boxes; plant K.....	do.....								
	40 percent Indian River, 60 percent Valencia; 2,500 field boxes; plant N.....	do.....								
	33 percent Seedlings, 67 percent Valencia; 1,000 field boxes; plant N.....	do.....								
	33 percent Seedlings, 67 percent Valencia; 1,128 field boxes; plant N.....	do.....								
	15 percent Pineapple, 85 per- cent Valencia; 2,979 field boxes; plant B.....	do.....								
	2 percent Pineapple, 98 percent Valencia; 2,977 field boxes; plant B.....	do.....								
	Valencia; 900 field boxes; plant M.....	do.....								
	Texas market; 2.....	Buffered; autoclaved; chicken pancreas; average and range.								
Canned.....	Valencia:									
	1,500 field boxes; plant A.....	Autoclaved 1 hour pH 7.2.....								
	4,500 field boxes; plant B.....	do.....								
	2,400 field boxes; plant C.....	do.....								
	1,800 field boxes; plant D.....	do.....								
	3,000 field boxes; plant E.....	do.....								
	1,800 field boxes; plant F.....	do.....								
	3,000 field boxes; plant G.....	do.....								
	2,400 field boxes; plant H.....	do.....								
	250 field boxes; plant I.....	do.....								

	2,000 field boxes; plant J	do			1. 0032				
	2,143 field boxes; plant K	do			1. 0015				
Reconsti- tuted	Canned concentrate reconsti- tuted: Midseason; 900 field boxes; plant M.	Autoclaved 1 hour pH 7.2			1. 0028				
	Valencia; 900 field boxes; plant M.	do			1. 0022				
	39 percent Pineapple, 19 per- cent Seedlings, and 42 per- cent Valencia; 4,300 field boxes; plant J.	do			1. 0024				
	Duplicate; plant J	do			1. 0018				
	Pineapple; 1,440 field boxes; plant B.	do			1. 0022				
	Frozen concentrate reconsti- tuted: 40 percent Indian River, 60 percent Valencia; 2,500 field boxes; plant N.	do			1. 0017				67
	33 percent Seedlings, 67 per- cent Valencia; 1,000 field boxes; plant N.	do			1. 0020				
	33 percent Seedlings, 67 per- cent Valencia; 1,128 field boxes; plant N.	do			1. 0020				
	15 percent Pineapple, 85 per- cent Valencia; 2,979 field boxes; plant B.	do			1. 0019				
	2 percent Pineapple, 98 per- cent Valencia; 2,977 field boxes; plant B.	do			1. 0017				
	Valencia; 900 field boxes; plant M.	do			1. 0012				
Orange- grapefruit sections: Canned, sweetened	42 percent Valencia, 58 percent Duncan; 342 field boxes; plant K.	do			.0022	.0118			
	33 percent Valencia, 67 percent Duncan; 1,200 field boxes; plant F.	do			.0018	.0103			
	Replicate	do			.0019	.0119			
	do	do			.0015	.0084			
Oyster:	Raw	1 sample, 4 specimens	Takadiastase-papain; 40,000 [200,000]	.24 [.048]	1.2 [.24]				25
Parsley:	Raw	Perejil (<i>Carum petroselium</i> Benth.)	Takadiastase	.095	.629				50
	Garden or retail sample	do		.088					90
	Garden or greenhouse sample	Buffered; heated 3 minutes; hog kidney		.170	1.20	.170	1.20		41

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

¹ mg. per 100 ml.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both				
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)				
Parsley—Con- tinue Raw—Continued	Garden or greenhouse sample	Buffered; heated 3 minutes; hog kidney		1. 200		1. 200					
	Stored in a wax bag:			. 700		. 620			41		
	3 days at room temperature	do		1. 000		. 830					
	2 weeks in refrigerator	do		1. 400		1. 400					
	2 weeks in crushed ice	do						. 28	8		
		Buffered; heated 45 minutes (abstract); chemical method.									
	Texas market; 3	Buffered; autoclaved; chicken pancreas; average and range.			{ . 0429 . 0365-. 0540	. 452					
	Texas market; 2	do			{ . 0294 . 0264-. 0324	. 354					
	do	do			{ . 0429 . 0426-. 0432	. 413					
Parsnip: Raw-----	Washington, D. C., market: 2	Buffered; autoclaved; average and range	{ . 0084 . 0070-. 0097		. 0068 . 0062-. 0073				114		
	3 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ . 0257 . 0247-. 0269	. 117	. 0367	. 167					
	Texas market; 2	do			{ . 0085 . 0083-. 0087	. 043					
		Autolysis; 40,000	. 063								
		[200,000]	[. 0126]								
Pea: Raw-----		Takadiastase; 40,000	. 12								
		[200,000]	[. 024]								
		Papain; 40,000	. 11								
		[200,000]	[. 022]								
	1 sample	Malt diastase; 40,000	. 025						24		
		[200,000]	[. 005]								
		Pancreatic amylase; 40,000	. 038								
		[200,000]	[. 0076]								
		Takadiastase-papain; 40,000	. 12								
		[200,000]	[. 024]								
Chicharos (<i>Pisum sativum</i> L.)-----		Takadiastase; papain; 40,000	. 12								
		[200,000]	[. 024]								
	2 samples, 2 pounds	Takadiastase-papain; 40,000	. 13	. 52					25		
		[200,000]	[. 026]	[. 104]							
		Takadiastase...	. 009	. 027							
Garden or retail sample-----		do	. 059		. 050				50		
		Buffered; heated 3 minutes; hog kidney;	{ . 023 . 019-. 026	. 114 . 097-. 13	. 022 . 020-. 023				90		
		average and range.									

Garden or greenhouse sample	Buffered; autoclaved; chicken pancreas	.097	.102					
Stored in a wax bag:								
1 day at room temperature	do	.088	.093					
3 days at room temperature	do	.056	.051					
1 week in refrigerator	do	.089	.070					
2 weeks in refrigerator	do	.089	.108					
1 week in crushed ice	do	.112	.112					
2 weeks in crushed ice	do	.108	.108					
Washington, D. C., market:								
3	Buffered; autoclaved; average and range	{ .0153 .0138-.0166	.0142 .0072-.0180					
6 <i>S. faecalis</i> , 5 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0301 .0188-.0445	.130 .0355 .0205-.0558					
Washington, D. C., market:								
3 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0098 .0053-.0121	.0069 .0063-.0074					
4 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0250 .0100-.0436	.097 .0135 .0111-.0158		.052			
Washington, D. C., market:								
2	Buffered; autoclaved; average and range	{ .0036 .0032-.0038	.0029					
4	Buffered; autoclaved; chicken pancreas; average and range	{ .0057 .0052-.0064	.024 .0045 .0042-.0054		.019			114
Washington, D. C., market:								
3	Buffered; autoclaved; average and range	{ .0070 .0066-.0078	.0041 .0038-.0044					
4	Buffered; autoclaved; chicken pancreas; average and range.	{ .0122 .0118-.0123	.049 .0117 .0110-.0130		.047			
Texas market; 3	do		{ .0269 .0175-.0379		.108			
Texas market; 7	do		{ .0240 .0164-.0461		.098			
Texas market; 3	do		{ .0203 .0096-.0346		.081			
Canned	Solid and liquid; 10 samples, 60 cans.	Takadiastase; average and range	{ .0017 .0010-.0022	.0044 .0032-.0052				59
		Buffered; heated 3 minutes; hog kidney	.012	.081 .010	.064			41
Dried, split:								
Green	Composite of several brands:							
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0085 .0083-.0086	.0064 .0040-.0086				
	4 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered, autoclaved; chicken pancreas; average and range.	{ .0201 .0115-.0285	.022 .0127-.0300	.024			
Yellow	Composite of several brands:							
	2	Buffered; autoclaved; average and range	{ .0056 .0049-.0063	.0042 .0041-.0043				114
	5	Buffered; autoclaved; chicken pancreas; average and range.	{ .0304 .0259-.0383	.033 .0216 .0165-.0265	.024			
Peach:								
Raw	1 sample, 3 specimens	Takadiastase-papain; 40,000 [200,000]	{ .017 [.0034]	.065 [.013]				25
Washington, D. C., market:								
	1 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	.0009	{ .0003 .0002-.0003				
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0023 .0021-.0024	.020 .0021-.0025	.020			114
Washington, D. C., market		Buffered; autoclaved; chicken pancreas	.00215	.00199				

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>						
			Moist basis (4a)	Moisture-free basis (4b)	Moist basis (5a)	Moisture-free basis (5b)	Moist basis (6a)				
Peach—Con. Raw—Continued	Elberta; Texas market; 4	Buffered; autoclaved; chicken pancreas; average and range.			.0013 .0010-.0019	.008			114		
Canned	Solid and liquid; 9 samples, 54 cans.	Takadiastase; average and range	{ .0005 .0003-.0012		.0015 .0010-.0029				59		
Dried	Composite of several brands: 1. 2.	Buffered; autoclaved Buffered; autoclaved; chicken pancreas; average and range.	{ .0019 .0045 .0034-.0056		.0033 .0053 .0040-.0065		.007		114		
Peanut: Roasted	1 sample, 1 pound	Takadiastase-papain; 40,000 [200,000]	.28 [.056]	.29 [.058]					25		
	Washington, D. C., market; 13	Buffered; autoclaved; chicken pancreas; average and range.	{ .0620 .0480-.0755	.063 .	.0511 .0440-.0650		.052		114		
Pear: Raw	Pera blanca (<i>Pirus communis</i>) Washington, D. C., market:	Takadiastase	<.001	<.005					50		
	1.	Buffered; autoclaved	.0008		.0006						
	2.	Buffered; autoclaved; chicken pancreas; average and range.	.0035	.024	{ .0023 .0021-.0025		.016				
	Washington, D. C., market	Buffered; autoclaved; chicken pancreas	.00319		.00276						
	Bartlett; Texas market; 4	Buffered; autoclaved; chicken pancreas; average and range.			{ .0018 .0013-.0023		.011		114		
Pecan	Washington, D. C., market; 5	do	{ .0344 .0240-.0430	.035	.0195 .0178-.0205		.020				
Pepper: Raw	Chile jalapeño (<i>Capsicum annuum</i> L.).	Takadiastase	.003	.037							
	Chile serrano (<i>Capsicum annuum</i> L. var. <i>acuminatum</i> Fing.).	do	.003	.028					50		
	Washington, D. C., market: 2.	Buffered; autoclaved; average and range	{ .0018 .0015-.0020		.0011 .0008-.0013						
	3 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0112 .0096-.0124	.190	.0098		.166				
	Sweet Bell; Texas market; 2	do			{ .0061 .0057-.0064		.100		114		
	Sweet Bell; Texas market; 6	do			{ .0037 .0026-.0044		.057				

Persimmon: Raw-----	Zapote negro (<i>Diospyros ebanaster</i>).-----	Takadiastase-----	.005	.029						50
Pigeonpea. See Bean and bean products, pigeon- pea.										
Pineapple: Raw-----	<i>Bromelia ananas</i> L.-----	Rat growth method-----							.02	11
	Washington, D. C., market; 3-----	Buffered; autoclaved; average and range	{ .0014 .0013-.0016		.0016 .0015-.0017					
		Buffered; autoclaved; chicken pancreas; average and range.	{ .0040 .0025-.0048	.029	.0059 .0040-.0093	.043				114
	Washington, D. C., market-----	Buffered; autoclaved; chicken pancreas.	.00167		.00183					
	Texas market; 4-----	Buffered; autoclaved; chicken pancreas; average and range.			{ .0008 .0005-.0012	.009				
Plantain banana: Raw-----	<i>Musa paradisiaca</i> L.; unripe-----	Buffered; autoclaved; takadiastase; chicken pancreas.			0					
	do-----	do-----			0					
	<i>Musa paradisiaca</i> L.; half rip- ened.	do-----			0					10
	do-----	do-----			.00014					
Plum: Red-----	Washington, D. C., market: 2-----	Buffered; autoclaved; average and range	{ .0009 .0008-.0010		.0005 .0002-.0007					
	3-----	Buffered; autoclaved; chicken pancreas; average and range.	{ .0030 .0025-.0034	.017	.029 .0027-.0031	.016				
	Santa Rosa; Texas market; 5-----	do-----			{ .0006 .0003-.0011	.005				
Yellow-----	Washington, D. C., market: 1 <i>S. faecalis</i> , 2 <i>L. casei</i> -----	Buffered; autoclaved; average and range	.0004		{ .0002 .0001-.0002					114
	2 <i>S. faecalis</i> , 4 <i>L. casei</i> -----	Buffered; autoclaved; chicken pancreas; average and range.	.0014	.012	{ .0010 .0007-.0011	.008				
Plum (Italian prune)-----	Texas market; 2-----	do-----			{ .0027 .0026-.0027	.014				
Pork: Bacon-----	1 sample, 2 specimens-----	Takadiastase-papain; 40,000----- [200,000]-----	.060 [.012]	.077 [.0154]						
	All visible fat removed; 1 sam- ple, 12 specimens.	Takadiastase-papain; 40,000----- [200,000]-----	.16 [.032]	.32 [.064]						25
Brain: Raw-----	1 sample-----	Autolysis; 40,000----- [200,000]-----		.068 [.0136]						130
Dried, de- fatted-----										
Ham: Raw-----	1 sample, 2 specimens-----	Takadiastase-papain; 40,000----- [200,000]-----	.058 [.0116]	.11 [.022]				.45		58
	All visible fat removed; 1 sam- ple.	Takadiastase-papain; 40,000----- [200,000]-----	.12 [.024]	.36 [.072]						25

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>						
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)				
Pork—Continued Ham—Continued Raw—Continued											
	1 sample	No treatment.....	.0006		.003						
		Autolysis.....	.007								
		pH 4 autoclaved 12 hours.....	.003		.005						
		0.1 N KOH autoclaved 1 hour.....	<.001		.002						
		2 N KOH autoclaved 30 minutes.....	<.001								
		Takadiastase.....	.015		.018						
		Chicken pancreas.....	.009		.009						
		Takadiastase.....	.009		.0078						
		do.....	.012		.0138						
		do.....	.0135		.0075						
		do.....	.0067		.0056						
		do.....	.0088								
		Takadiastase; 40,000 [200,000].....	.040								
Cured			[.008]								
Smoked	Washington, D. C., market; 2	Buffered; autoclaved; average and range.....	{ .0004		.0003						
		Buffered; autoclaved; chicken pancreas; average and range.....	{ .0003–.0004		.0002–.0003						
			{ .0051	.016	.0106	.033					
			{ .0040–.0061		.0082–.0129						
Heart	1 sample	Autolysis; 40,000 [200,000].....		.15							
				[.03]							
		Autolysis natural pH; 40,000 [200,000].....		.0068							
				[.00136]							
		Takadiastase natural pH; 40,000 [200,000].....		.049							
				[.0098]							
		Papain natural pH; 40,000 [200,000].....		.021							
				[.0042]							
		Pepsin natural pH; 40,000 [200,000].....		.0063							
				[.00126]							
		Trypsin natural pH; 40,000 [200,000].....		.010							
				[.002]							
		Pancreatin natural pH; 40,000 [200,000].....		.010							
				[.002]							
		Autolysis natural pH; 40,000 [200,000].....		.0017							
				[.00034]							
		Takadiastase pH 4.0; 40,000 [200,000].....		.020							
				[.004]							
		Malt diastase pH 4.5; 40,000 [200,000].....		.0065							
				[.0013]							
Kidney	1 sample	Autolysis; 40,000 [200,000].....			.24						
					[.048]						

	Hog kidney	1.00		1.00			61
	do	.87		.84			
Liver: Raw	1 sample	Autolysis; 40,000 [200,000]	2.5 [.5]				130
		Tadakiastase	.084				
Dried, de- fatted	Texas A. and M. College Ani- mal Husbandry; 2.	do	.063				103
		Buffered; autoclaved; chicken pancreas; average and range.		{ .2210 .2090-.2330	.691		
Loin	1 sample, 4 specimens	Takadiastase-papain; 40,000 [200,000]	.065 [.013]	.17 [.034]			58
	All visible fat removed; 1 sam- ple, 3 specimens.	Takadiastase-papain; 40,000 [200,000]	.084 [.0168]	.31 [.062]			
	All visible fat removed; 1 sam- ple, 3 specimens.	Takadiastase-papain; 40,000 [200,000]	.14 [.028]	.47 [.094]			103
		Takadiastase	.0069				
Lung	Washington, D. C., market:	Buffered; autoclaved	.0003		.0002		114
	1 3 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0016 .0015-.0018	.005	.0032	.010	
Muscle: Raw	1 sample	Autolysis; 40,000 [200,000]		.055 [.011]			130
		Takadiastase	Approx. .008	At least .016			
Dehy- drated, canned	Plant A	do	.0024				123
	Plant B	do	.0015				
	Plant C	do	.0011				
	Plant D	do	.0035				
	Plant A	do	.0022				
	Stored 20 weeks at 0° F	do	.0022				
	Stored 20 weeks at 120° F	do	.0019				
	Plant B	do	.0026				
	Stored 20 weeks at 0° F	do	.0021				
	Stored 20 weeks at 120° F	do	.0020				
	Plant C	do	.0030				
	Stored 20 weeks at 0° F	do	.0031				
Sausage	Stored 20 weeks at 120° F	do	.0036				
	Washington, D. C., market:	Buffered; autoclaved; average and range	{ .0004 .0002-.0005		.0006		
	4 <i>S. faecalis</i> , 2 <i>L. casei</i>				.0005-.0006		114
	9 <i>S. faecalis</i> , 7 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0093 .0057-.0136	.014	.0138	.021	
Spleen	Washington, D. C., market	Buffered; autoclaved; chicken pancreas			.0108-.0194		130
	1 sample	Autolysis; 40,000 [200,000]		.00451 [.017]	.00620		
Potato and various parts:	Raw	1 sample, 1 specimen	Takadiastase-papain; 40,000 [200,000]	.14 [.028]	.63 [.126]		25

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Potato and various parts—Continued										
Raw—Continued										
1 sample.....		Takadiastase-papain; 40,000.....	.100							
		[200,000].....	[.020]							
1 sample.....		Takadiastase-papain; 40,000.....	.083							
		[200,000].....	[.0166]							
1 assay.....		Takadiastase; 40,000.....	.103							
		[200,000].....	[.0206]							
		Takadiastase; rat liver; 40,000.....	.15							
		[200,000].....	[.03]							
		Takadiastase-papain; method a, tur- bidimetric.			.046					
		Takadiastase-papain; method a, aci- dimetric.			.048					
		Takadiastase-papain; method b, aci- dimetric.			.048					
Garden or retail sample.....		Takadiastase.....	.005							
New, red.....		do.....	.023							
		Hog kidney.....	.043							
		Autolysis.....	.006							
Old, red; 7 months storage.....		Takadiastase.....	.007							
New, white.....		Hog kidney.....	.005							
		Takadiastase.....	.017							
		Hog kidney.....	.053							
		Autolysis.....	.004							
Old, white; 7 months storage.....		Takadiastase.....	.004							
		Hog kidney.....	.004							
		Buffered; heated 45 minutes (abstract); chemical method.						.26	8	
		Water extract; mild heat; chemical method.			.040					
Green Mountain; New York: Whole calculated from peeled +peel.		Buffered; autoclaved; chicken pancreas.....	[.0088]	[.045]	[.0114]	[.058]				
Pealed, 3.....		Buffered; autoclaved; chicken pancreas; average and range.	[.0066 .0061-.0069]	[.037 .0047-.0120]						
Peel, 2.....		do.....	[.0148 .0142-.0154]	[.068 .0207]						
Irish Cobbler, Maine: Whole calculated from peeled +peel.		Buffered; autoclaved; chicken pancreas.....	[.0130]	[.065]	[.0135]	[.068]			114	

Peeled, 2.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0106 .0092-.0120	.056	.0116 .0080-.0152	.061			
Peel, 3 <i>S. faecalis</i> , 2 <i>L. casei</i>	do.....	{ .0201 .0192-.0212	.083	.0193 .0163-.0223	.089			
Irish Cobbler; North Carolina: Whole calculated from peeled +peel.	Buffered; autoclaved..... Buffered; autoclaved; chicken pancreas	{ [.0037] [.0065]		[.0036] [.0061]	[.029]			
Peeled: 2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0027 .0026-.0027		.0025 .0022-.0027				
5 <i>S. faecalis</i> , 6 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0044 .0034-.0050	.021	.0037 .0035-.0042	.018			
Peel: 2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0069 .0061-.0076		.0073 .0065-.0080				
5 <i>S. faecalis</i> , 6 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0133 .0111-.0156	.064	.0138 .0110-.0195	.066			
Seabago; Alabama: Whole calculated from peeled +peel.	Buffered; autoclaved..... Buffered; autoclaved; chicken pancreas	{ [.0028] [.0056]	[.029]	[.0034] [.0078]	[.041]			
Peeled: 3.....	Buffered; autoclaved; average and range	{ .0022 .0015-.0032		.0026 .0016-.0035				
5.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0044 .0035-.0055	.022	.0061 .0042-.0084	.031			
Peel: 3.....	Buffered; autoclaved; average and range	{ .0052 .0031-.0064		.0068 .0035-.0091				
5 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0106 .0069-.0142	.057	.0147 .0090-.0181	.079			
Seabago; South Carolina: Whole calculated from peeled +peel.	Buffered; autoclaved..... Buffered; autoclaved; chicken pancreas	{ [.0036] [.0069]	[.034]	[.0037] [.0076]	[.038]			
Peeled: 3 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0031 .0026-.0038		.0031 .0023-.0046				
5.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0053 .0085-.0069	.026	.0069 .0039-.0127	.034			
Peel: 4.....	Buffered; autoclaved; average and range	{ .0059 .0049-.0071		.0069 .0053-.0080				
6 <i>S. faecalis</i> , 7 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0142 .0103-.0161	.071	.0115 .0071-.0180	.058			
Triumph; Alabama: Whole calculated from peeled +peel.	Buffered; autoclaved..... Buffered; autoclaved; chicken pancreas	{ [.0028] [.0052]	[.028]	[.0036] [.0076]	[.041]			
Peeled: 4 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0020 .0012-.0033		.0025 .0016-.0034				
5.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0042 .0025-.0064	.023	.0065 .0024-.0115	.036			
Peel: 3.....	Buffered; autoclaved; average and range	{ .0062 .0046-.0077		.0081 .0057-.0100				
5.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0098 .0080-.0133	.050	.0124 .0082-.0153	.063			

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* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays									
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both					
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)				
Potatoes and various parts—Con- tinued Raw—Continued												
Triumph; South Carolina:												
Whole calculated from peeled +peel.	Buffered; autoclaved.....	[. 0031]			[. 0038]							
Peeled:	Buffered; autoclaved; chicken pancreas.....	[. 0043]	[. 022]		[. 0054]	[. 028]						
4 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	.0022			.0028							
6 <i>S. faecalis</i> , 7 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	.0013-.0034			.0019-.0043							
Peel:												
3.....	Buffered; autoclaved; average and range	.0034	.018		.0043	.023						
5 <i>S. faecalis</i> , 6 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	.0025-.0043			.0023-.0062							
White Rose; California:												
Whole calculated from peeled +peel.	Buffered; autoclaved.....	[. 0026]			[. 0028]							
Peeled:	Buffered; autoclaved; chicken pancreas.....	[. 0073]	[. 041]		[. 0072]	[. 041]						
2.....	Buffered; autoclaved; average and range	.0021			.0023							
4 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	.0013-.0028			.0017-.0029							
Peel:												
2.....	Buffered; autoclaved; average and range	.0074	.040		.0065	.035						
3.....	Buffered; autoclaved; chicken pancreas; average and range.	.0051-.0112										
Idaho bakers; Texas market; 2	do.....											
Prickly pear: Raw.....	Nopales (<i>Opuntia</i> sp.).....	Takadiastase.....	.015	.300								
Prickly pear fruit.....	Tuna (<i>Opuntia</i> sp.).....	do.....	.004	.032								
Prune: Dried.....	Composite of several brands: 2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	.0040		.0030							
	4 <i>S. faecalis</i> , 6 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	.0036-.0043		.0026-.0036							
			.0060	.008	.0048	.007						
			.0052-.0065		.0043-.0054							

Prune, Italian. See Plum (Italian prune).							
Pulque	Takadiastase.....	.008	.615				
	.....do.....	.009	.825				
							50
Pumpkin: Raw.....	High-quality sample.....	Autolysis.....	.001				
		Takadiastase.....	.002				
		Hog kidney.....	.030				
							120
	Washington, D. C., market:						
	2.....	Buffered; autoclaved; average and range	{ .0050 .0037-.0063		.0042		
	3.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0093 .0083-.0101	.133	.0104	.149	
		.....do.....			{ .0092-.0113 .0051		
	Texas market; 3.....					.066	
						.0046-.0058	
Purslane: Raw.....	Verdolagas (<i>Portulaca oleracea</i> L.).....	Takadiastase.....	.029	.310			
Radish: Raw.....	Rábano.....	.....do.....	.006	.108			
	White; garden or retail sample.....	.....do.....	.010		.011		
	Garden or greenhouse; 2 sam- ples.....	Buffered; heated 3 minutes; hog kidney; average and range.	{ .013 .012-.013	.22 .21-.23	.011 .010-.012	.20 .18-.22	
	Washington, D. C., market:						
	2.....	Buffered; autoclaved; average and range	{ .0028 .0022-.0034		.0026		
	4.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0036 .0031-.0040	.078	.0034	.074	
		Buffered; autoclaved.....	.0054				
		Buffered; autoclaved; takadiastase.....	.0074				
		Buffered; autoclaved; hog kidney.....	.0085				
		Buffered; autoclaved; chicken pancreas	.0164				
		.....do.....	.00385		.00419		
	Red Globe; Texas market; 2.....	Buffered; autoclaved; chicken pancreas; average and range.			.0103	.224	
		.....do.....			{ .0093-.0112 .0094		
						.192	
						.0089-.0099	
Raisin.....	1 sample, 1 pound.....	Takadiastase-papain; 40,000 [200,000].....	.028 [.0056]	.037 [.0074]			
	Seedless; composite of several brands:						
	2.....	Buffered; autoclaved; average and range	{ .0066 .0060-.0071		.0072		
	4 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0106 .0079-.0123	.013	.0106	.013	
						.0090-.0135	
Raspberry, red: Raw.....	Washington, D. C., market:	Buffered; autoclaved; average and range	{ .0035 .0034-.0035		.0028		
	2.....					.0023-.0033	
	5 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0059 .0050-.0064	.043	.0051	.038	
						.0041-.0056	

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Other assays Moist basis (7a)	Reference No. (8)		
			Microbiological assays								
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both				
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)				
Rhubarb: Raw-----	Washington, D. C., market: 1----- 3 <i>S. faecalis</i> , 2 <i>L. casei</i> -----	Buffered; autoclaved----- Buffered; autoclaved; chicken pancreas; average and range.	.0005 .0029 .0024-.0032	.052 .0014 .025							
	Washington, D. C., market-----	Buffered; autoclaved----- Buffered; autoclaved; takadiastase----- Buffered; autoclaved; hog kidney----- Buffered; autoclaved; chicken pancreas----- Buffered; autoclaved; chicken pancreas; average and range.	.0019 .0022 .0050 .0091								
	Texas market; 3-----				.0035 .0032-.0042	.041					
Rice: Rough-----	Arkansas Experiment Station: 2----- 3 <i>S. faecalis</i> , 2 <i>L. casei</i> -----	Buffered; autoclaved; average and range----- Buffered; autoclaved; chicken pancreas; average and range.	.0159 .0118-.0200 .0336 .0278-.0378		.0165 .0110-.0220 .0290 .031				114		
	Louisiana Experiment Station: 3----- 5-----	Buffered; autoclaved; average and range----- Buffered; autoclaved; chicken pancreas; average and range.	.0199 .0181-.0217 .0409 .0381-.0430		.0149 .0132-.0182 .0298 .0265-.0324						
Brown-----	Husked (<i>Oriza sativa</i> L.); Cuban market.	Buffered; autoclaved; takadiastase; chicken pancreas.			0				10		
	Arkansas Experiment Station: 2----- 3-----	Buffered; autoclaved; average and range----- Buffered; autoclaved; chicken pancreas; average and range.	.0056 .0055-.0058 .0239 .0237-.0240		.0113 .0108-.0118 .0209 .0158-.0310						
	Louisiana Experiment Station: 1----- 2-----	Buffered; autoclaved----- Buffered; autoclaved; chicken pancreas; average and range.	.0218 .0386 .0372-.0400		.0315 .0333 .0310-.0355						
	Louisiana Experiment Station: 3 <i>S. faecalis</i> , 2 <i>L. casei</i> ----- 6 <i>S. faecalis</i> , 5 <i>L. casei</i> -----	Buffered; autoclaved; average and range----- Buffered; autoclaved; chicken pancreas; average and range.	.0083 .0067-.0094 .0281 .0210-.0378		.0088 .0086-.0089 .0234 .0172-.0368						
	Louisiana Experiment Station: 1----- 2-----	Buffered; autoclaved----- Buffered; autoclaved; chicken pancreas; average and range.	.0058 .0175 .0161-.0189		.0078 .018 .0159 .0140-.0178				114		

	Washington, D. C., market:							
	3.	Buffered; autoclaved; average and range	.0088 .0081-.0091		.0056 .0051-.0059			
	3 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	.0186 .0180-.0196	.021	.0113 .0108-.0120	.012		
	Washington, D. C., market; 2	(Buffered; autoclaved)	.0094		.0066			
		Buffered; autoclaved; chicken pancreas; average and range.	.0199 .0190-.0208	.022	.0126 .0122-.0130	.014		
Parboiled	Avorio, Riso raffinato, var. Originario	Acetate buffer; autoclaved 1 hour			.0053			
	Avorio, Riso raffinato, var. "77"	do			.0071			99
	Avorio, Riso raffinato, var. Maratelli	do			.0047			
Milled	Avorio	Water; steamed; range			.007-.008			38
		Takadiastase-papain; 40,000	.087					26
		[200,000]	[.0174]					
	Polished	Rat growth method					.02	11
		N H ₂ SO ₄ ; autoclaved 1 hour			0			
		0.01 N H ₂ SO ₄ ; autoclaved 1 hour			.0031			
		Acetate buffer pH 4.5; autoclaved 1 hour			.0052			
	Riso normale	Water; autoclaved 1 hour			.0052			99
		0.01 N NaOH autoclaved 1 hour			.0057			
		0.01 N KOH autoclaved 1 hour			.0045			
	Riso raffinato, var. Originario	Acetate buffer; autoclaved 1 hour			.0048			
	Riso raffinato, var. "77"	do			.0067			
	Riso raffinato, var. Maratelli	do			.0049			
	Normal processing	Water; steamed; range			.003-.004			38
	Arkansas Experiment Station:							
	3	Buffered; autoclaved; average and range	.0056 .0035-.0067		.0073 .0057-.0081			
	5 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	.0141 .0094-.0181	.015	.0141 .0103-.0180	.015		114
Breakfast cereal	1 sample	Takadiastase-papain; 40,000	.016	.017				25
		[200,000]	[.0032]	[.0034]				
	do	Buffered; autoclaved; takadiastase	.011					90
	3 samples	Buffered; autoclaved; hog kidney; average and range.	.009 .006-.012		.010 .008-.011			41
	Washington, D. C., market:							
	2	Buffered; autoclaved; average and range	.0056 .0055-.0057		.0034 .0033-.0035			
	4	Buffered; autoclaved; chicken pancreas; average and range.	.0094 .0063-.0127	.010	.0059 .0058-.0060	.006		114
		N H ₂ SO ₄ ; autoclaved 1 hour			0			
		0.01 N H ₂ SO ₄ ; autoclaved 1 hour			.034			
		Acetate buffer pH 4.5; autoclaved 1 hour			.048			
Bran	Pula, normale	Water; autoclaved 1 hour			.044			
		0.01 N NaOH; autoclaved 1 hour			.0153			
		0.01 N KOH; autoclaved 1 hour			.0127			
	Pula, normale, var. Originario	Acetate buffer pH 4.5; autoclaved 1 hour			.045			
	Pula, Avorio (parboiled), var. Originario	do			.0170			
	Pula, normale, var. "77"	do			.045			

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Reference No. (8)	
			Microbiological assays				Other assays Moist basis (7a)		
			<i>S. faecalis</i>		<i>L. casei</i>				
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)		
Rice—Continued									
Bran—Continued									
Pula, Avorio (parboiled), var. "77."		Acetate buffer pH 4.5; autoclaved 1 hour—Continued			.0448				
Germ Polishing	Gemma, normale, var. Originario	do			.081				
	Farinaccio, normale, var. Ori- ginario.	do			.039				
	Farinaccio, Avorio (parboiled), var. Originario.	do			.0157				
	Normal processing	Water; steamed; range			.026-.040				
	Avorio (parboiled)	Water; steamed			.012				
Rutabaga:									
Raw	Washington, D. C., market: <i>3 S. faecalis, 2 L. casei</i>	Buffered; autoclaved; average and range	{ .0031		.0035				
	<i>6 S. faecalis, 5 L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0030-.0031		.0034-.0035				
	Texas market; 2	do	{ .0066	.057	.069	.060			
			{ .0042-.0094		.0048-.0100				
					{ .0030	.022			
					{ .0027-.0032				
Rye:									
Whole grain	Ground feedstuff; 3 tests	Chick-growth method; average and range						{ .17 .04-.20 } 75	
	Ground feedstuff; 5 samples	Buffered; autoclaved; hog kidney; aver- age and range.	{ .073		.045				
	1948 crop; composite U. S. sam- ple:		{ .065-.094		.041-.057				
	2	Buffered; autoclaved; average and range	{ .0123		.0153				
			{ .0098-.0147		.0106-.0200				
	3	Buffered; autoclaved; chicken pancreas; average and range.	{ .0352	.040	.0336	.038			
			{ .0270-.0442		.0304-.0365				
Flour	Washington, D. C., market; 3 <i>S. faecalis, 2 L. casei</i>	do	{ .0197	.022	.0163	.018			
			{ .0165-.0215		.0161-.0164				
Salmon:									
Raw	1 sample, 1 specimen	Takadiastase-papain; 40,000 [200,000]	.087	.31					
			[.0174]	[.062]					
Canned	Drained solids; 10 samples, 60 cans.	Takadiastase; average and range	{ .0026		.0069				
	Red (<i>Oncorhynchus</i>); drained solids; 1 sample, 12 cans.	Hog pancreas	{ .0010-.0044		.0053-.0102				
Sapodilla:					.0005				
Raw	Mesple (<i>Sapota achras</i> Mill.)	Rat growth method					<.02	11	

Sardine: Canned	Atlantic (<i>Clupea harengus</i>); drained solids; 1 sample, 12 cans:						
	Sample No. 1	Hog pancreas		.0018			
	Duplicate	do		.0010			
	Sample No. 2	do		.0019			
	Duplicate	do		.0012			
	Sample No. 3	do		.0014			
	Duplicate	do		.0010			
	Sample No. 4	do		.0019			
	Duplicate	do		.0019			
	Sample No. 5	do		.0020			
	Duplicate	do		.0012			
	Sample No. 6	do		.0027			
	Duplicate	do		.0023			
	Sample No. 7	do		.0021			
	Duplicate	do		.0012			
	Sample No. 8	do		.0019			
	Duplicate	do		.0008			
Pacific (<i>Sardinops caerulea</i>):		Hog pancreas		.0008			
Canned in tomato sauce; total contents, 12 cans.		do		.0005			
Canned in brine; drained solids, 12 cans.							89
Sauerkraut:							
Raw	1 sample	Takadiastase-papain; 40,000 [200,000]	.0186 [.00372]				26
Seepweed:							
Raw	Romeritos (<i>Dondia</i> sp.)	Takadiastase	.093	.860			50
Sirup, cane:							
Unblended	Commercial; table grade	do	.0010				101
Sorghum:							
Whole grain	White kafir; 1948 crop; composite U. S. sample:						
	3	Buffered; autoclaved; average and range	{ .0055 .0020-.0084		.0052- .0035-.0064		
	5	Buffered; autoclaved; chicken pancreas; average and range.	{ .0226 .0177-.0263	.025	.0183 .0153-.0212	.021	
	Yellow milo; 1948 crop; composite U. S. sample:						
	3	Buffered; autoclaved; average and range	{ .0122 .0071-.0151		.0103 .0085-.0125		
	4	Buffered; autoclaved; chicken pancreas; average and range.	{ .0223 .0177-.0250	.025	.0214 .0181-.0260	.024	
Soybeans. See Bean and bean products, soybeans.							
Spinach:							
Raw	2 samples, 2 pounds	Takadiastase-papain; 40,000; average [200,000] 40,000; range [200,000]	.24 [.048] .17-.30 [.034-.06]	2.3 [.46]			25

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

⁵ Communication from F. M. Strong.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Spinach—Continued Raw—Continued										
	1 sample.....	Autolysis; 40,000 [200,000].....	.19 [.038]							
		Takadiastase; 40,000 [200,000].....	.30 [.06]						24	
		Autoclaved; 40,000 [200,000].....	.13 [.026]							
Espinaca (<i>Spinacia oleracea</i> L.)	Takadiastase.....	.058	.517						50	
High-quality sample.....	do.....	.053							120	
Garden or retail sample.....	Hog kidney.....	.085								
	Water extract.....	.024								
	Acid hydrolysis.....	.032								
	Alkaline hydrolysis.....	.021								
Garden or retail; 3 samples.....	Takadiastase.....	.076								
	Takadiastase; average and range.....	{ .082 .076-.089								
	Hog kidney.....		.90							
Garden or retail sample.....	do.....		.68							
Stored 32 hours at room temperature.....	do.....									
Stored 5 days in refrigerator.....	do.....			1.00						
Stored 5 days iced.....	do.....			1.15						
1 sample.....	Buffered; heated 3 minutes; hog kidney.....	.270								
	Takadiastase.....	.073								
	Pancreatin.....	.032								
1 sample.....	Hog kidney.....	.110								
	Takadiastase; hog kidney.....	.120								
	Pancreatin; hog kidney.....	.089								
	Buffered; heated 3 minutes; incubated pH 4.5.....	.018								
1 sample.....	Buffered; heated 3 minutes; takadi- stase.....	.018								
	Incubated pH 4.5.....	.078								
	Takadiastase.....	.095								
	Takadiastase (corrected for conjugate content of takadiastase).....	(.083)								
Garden or greenhouse; 3 <i>S.</i> <i>faecalis</i> , 2 <i>L. casei</i> samples.....	Buffered; heated 3 minutes; hog kid- ney; average and range.....	{ .28 .26-.30	2.23 1.90-2.70		.225 .22-.23		1.90 1.60-2.20			
Garden or greenhouse sample.....	Buffered; heated 3 minutes; hog kidney.....		2.700				2.200			
Stored in a wax bag:										
1 day at room temperature.....	do.....			2.000			1.900			
2 days at room temperature.....	do.....			2.000			1.700			
3 days at room temperature.....	do.....			1.600			1.400			
1 week in refrigerator.....	do.....			2.000			2.100		41	

	2 weeks in refrigerator	do	2. 700	1. 800				
	1 week in crushed ice	do	2. 200	2. 300				
	2 weeks in crushed ice	do	3. 100	2. 100				
		Buffered; heated 45 minutes (abstract); chemical method.	.42					.58
	Washington, D. C., market:							8
	1	Buffered; autoclaved	.1010	.1100				
	3	Buffered; autoclaved; chicken pancreas; average and range.	{ .0943 .0928-.0959	{ 1.407 .0938-.1120	{ .1053 .0310	{ 1.572 .0300-.0320		
	Washington, D. C., market; 2	Buffered; autoclaved; average and range	.0360					
	Washington, D. C., market; 4	Buffered; autoclaved; chicken pancreas; average.	.0654	1.055	.0574	.926		
		Buffered; autoclaved; average and range	{ .0344 .0257-.0424	{ .0330 .0261-.0432				114
		Buffered; autoclaved; chicken pancreas; average and range.	{ .0482 .0438-.0557	{ .0486 .0458-.0533	{ .600 .0815	{ 1.181 .0786-.0845		
	Texas market; 2	do						
	Bloomsdale; Texas market; 2	do						
	do	do						
Canned	Solid and liquid; 10 samples, 60 cans.	Takadiastase; average and range	{ .0074 .0040-.0165	{ .0207 .011-.051				59
	Brand 1	Buffered; heated 3 minutes; hog kidney; method a.	.093	.084				
		Buffered; heated 3 minutes; hog kidney; method b.			.082			
	Brand 2	Buffered; heated 3 minutes; hog kidney; method a.	.043	.041				91
		Buffered; heated 3 minutes; hog kidney; method b.			.040			
	Brand 1	Buffered; heated 3 minutes; hog kidney	.093	1.340	.084	1.210		
	do	do	.092	1.240	.083	1.120		
	Brand 2	do	.043	.620	.041	.590		
	Brand 3	do	.012	.190	.012	.190		
	Brand 4	do	.051	.535				
	Brand 5	do	.093	1.110				
	Solid and liquid; initial 2 samples, 2 cans.	Takadiastase; average					.0074	
	Stored 2 months at 70° F.	do					.013	
	Stored 2 months at 90° F.	do					.009	
	Stored 2 months at 100° F.	do					.014	
	Stored 4 months at 70° F.	do					.024	
	Stored 4 months at 90° F.	do					.021	
	Stored 4 months at 100° F.	do					.016	
	Stored 6 months at 70° F.	do					.017	
	Stored 6 months at 90° F.	do					.014	
	Stored 12 months at 100° F.	do					.009	
Dried	1 sample	Untreated	.242					
		Chicken pancreas	.615					
		Hog kidney	.705					
		Chicken pancreas; hog kidney	.925					107

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)					Reference No. (8)	
			Microbiological assays				Other assays Moist basis (7a)		
			<i>S. faecalis</i>		<i>L. casei</i>				
			Moist basis (4a)	Moisture-free basis (4b)	Moist basis (5a)	Moisture-free basis (5b)	Moist basis (6a)		
Spinach—Continued Dried—Continued	1947 A.O.A.C. collaborative assay. 1948 A.O.A.C. collaborative assay (1947 sample stored at -40°)	No enzyme treatment; specified method; average and range.			.659 .426-1.05			43 44 46 114 90 91 41 120	
		Buffered; autoclaved; chicken pancreas; specified method, average and range.			1.289 .78-1.70				
		No enzyme treatment; other than specified method; average and range.							
		Other treatments or other than specified method; average and range.							
		Chick growth method; 2 laboratories							
		Chick growth method; 4 laboratories; average and range.							
		Chick hematocrit method; 1 laboratory							
		Chick hemoglobin method; 1 laboratory							
		Microbiological and chick assays					1.7		
		Standard sample; 56 <i>S. faecalis</i> , 55 <i>L. casei</i> .	1.097 .820-1.390	1.124	1.060 .860-1.390	1.086			
Spinach, New Zealand: Raw	Garden or retail sample	Water extract	.090		.095			114 90 91 41 114	
	Garden or retail sample	Takadiastase	.180		.150				
	Garden or retail sample	Hog kidney	.170		.155				
	Garden or retail sample	Takadiastase	.190		.190				
	Stored 3 days at room temperature.	Hog kidney		1.65		1.50			
	Stored 13 days in refrigerator			.46		.54			
	Stored 17 days iced				1.25		1.20		
	1 sample				1.42		1.58		
	Garden or greenhouse sample	Buffered; heated 3 minutes; hog kidney	.082						
	Texas market; 4		.17	1.60	.16	1.50			
Squash: Raw	Acorn; high-quality sample	Buffered; autoclaved; chicken pancreas; average and range.			.0867 .0776-.0917			120	
	Acorn; Washington, D. C., market:	Takadiastase	.006						
	3	Hog kidney	.006						
	2	Buffered; autoclaved; average and range	.0099 .0092-.0109		.0104 .0097-.0112				
		Buffered; autoclaved; chicken pancreas; average and range.	.0212 .0194-.0229	.175	.0197 .0183-.0211	.163			
	Acorn; Texas market; 3		do				.0136 .0129-.0145		
							.095		

	Cushaw or kershaw; Texas market; 2.	do		.0021 .0019-.0022 .0043 .0040-.0045 .0143 .0123-.0163 .0186 .0176-.0195 .0090 .0087-.0093	.042 .056 .204 .344 .143		114
	Danish; Texas market; 2.	do					
	Danish; Texas market; 4.	do					
	Patty Pan; Texas market; 3.	do					
	Patty Pan; Texas market; 2.	do					
	White; high-quality sample		Takadiastase..... Hog kidney.....	.013 .037			120
	Yellow Crookneck; high-quality sample.		Takadiastase..... Hog kidney.....	.057 .031			
	Yellow Crookneck; Texas market; 3.		Buffered; autoclaved; chicken pancreas; average and range.		.0073 .0065-.0078 .0159 .0108-.0189	.101 .215	
	Yellow Crookneck; Texas market; 4.	do					
	Yellow Crookneck; Washington, D. C., market:						
	1.		Buffered; autoclaved.....	.0054	.0045		
	2.		Buffered; autoclaved; chicken pancreas; average and range.	.0135	.190	.0096 .0094-.0098	.135
	Yellow Crookneck; Washington, D. C., market.		Buffered; autoclaved; chicken pancreas.	.0122	.00932		114
	Caserta; Texas A. and M. College Farm; 2.		Buffered; autoclaved; chicken pancreas; average and range.		.0110 .0099-.0120 .0165 .0152-.0178	.200 .250	
	Early prolific straight neck; Texas A. and M. College Farm; 2.		do				
	Patty Pan; Texas A. and M. College Farm; 3.	do			.0239 .0148-.0304	.314	
	Zucchini black; Texas A. and M. College Farm; 2.	do			.0108 .0099-.0116	.216	
	Zucchini; high-quality sample		Autolysis..... Takadiastase..... Hog kidney..... Takadiastase.....	.009 .004 .038 .020	.233		120
	Squash flower	Flor de calabaza (<i>Cucurbita mexicana</i> L.).	do	.020	.295		
	Squash seed	Semilla de calabaza (<i>Cucurbita pepo</i> L.).	do	.140	.150		
	Strawberry:	Raw	1 sample	Takadiastase-papain; 40,000..... [200,000].....	.023 [.0046]	.23 [.046]	25
		Washington, D. C., market:	3.	Buffered; autoclaved; average and range	.0018 .0014-.0022	.0014 .0012-.0016	
			4.	Buffered; autoclaved; chicken pancreas; average and range.	.0051 .0033-.0073	.063 .0046 .0034-.0056	.057
		Washington, D. C., market	do	Buffered; autoclaved..... Buffered; autoclaved; takadiastase..... Buffered; autoclaved; hog kidney..... Buffered; autoclaved; chicken pancreas..... do	.0038 .0047 .0088 .0085 .00425		114
		Ranger; Texas A. and M. College Farm; 2.		Buffered; autoclaved; chicken pancreas; average and range.		.00394 .0061 .0057-.0065	

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Sweetpotato: Raw-----	2 samples, 4 specimens-----	Takadiastase-papain; 40,000; average [200,000]----- 40,000; range ----- [200,000]-----	.067 [.0134] .050-.084 [.010-.0168]	.23 [.046]					25 10 120 114 67 25 100 50	
	Yellow (<i>Ipomoea batata</i> L.); Cuban market.	Buffered; autoclaved; takadiastase; chicken pancreas.			0					
	do-----	do-----			.00016					
	do-----	do-----			.00039					
	High-quality sample-----	Autolysis-----	.004							
		Takadiastase-----	0							
		Hog kidney-----	.035							
	Puerto Rican; Texas market; 2-----	Buffered; autoclaved; chicken pancreas; average and range.			.0053 .0049-.0057	.018				
	Puerto Rican; Texas market; 3-----	do-----			.0191	.064				
					.0141-.0257					
Tangerine: Raw-----	Washington, D. C., market: 1-----	Buffered; autoclaved-----	.0012		.0014				114	
	2-----	Buffered; autoclaved; chicken pancreas; average and range.	.0043 .0041-.0044	.038	.0074 .0069-.0078	.066				
	Washington, D. C., market-----	Buffered; autoclaved; chicken pancreas-----	.00480		.00619					
Tangerine juice: Raw, sweetened.	700 field boxes; plant A-----	Autoclaved 1 hour pH 7.2-----			1.0012				67	
	Canned, sweetened.	700 field boxes; plant A-----	do-----		1.0018					
Tomato: Raw: Red-----	2 samples, 6 specimens-----	Takadiastase-papain; 40,000; average [200,000]----- 40,000; range ----- [200,000]-----	.075 [.015] .040-.11 [.008-.022]	1.3 [.26]					25 100 50	
		Takadiastase-papain; method a, tur- bidimetric.			.036					
	1 sample-----	Takadiastase-papain; method a, aci- dimetric.			.037					
		Takadiastase-papain; method b, aci- dimetric.			.035					
		Takadiastase-----	.011	.118						
	Jitomate (<i>Lycopersicum esculen- tum</i> L.)-----									

High-quality sample	do	.0004					120
	Hog kidney	.013					
	Water extract	.003		.004			
Garden or retail sample	Acid hydrolysis	.004		.004			
	Alkaline hydrolysis	.002		.003			
	Takadiastase	.008		.010			90
Garden or retail sample	Water extract	.013		.011			
	Takadiastase	.012		.012			
Garden or greenhouse sample	Hog kidney	.014		.012			41
Ripe, hothouse	Buffered; heated 3 minutes; hog kidney	.014					
	Buffered; heated 45 minutes (abstract); chemical method.	.05					.063
Ripe	do						8
Washington, D. C., market:							
2	Buffered; autoclaved; average and range	{ .0044 .0039-. 0049		.0040 .0039-. 0041			
3 S. faecalis, 2 L. casei	Buffered; autoclaved; chicken pancreas; average and range	{ .0082 .0074-. 0086	.155	.0064	.121		
Washington, D. C., market	Buffered; autoclaved; chicken pancreas	.00770		.00909			
Texas market; 2	Buffered; autoclaved; chicken pancreas; average			.0016	.023		
Marglobe; Texas A. and M. College Farm; 3	Buffered; autoclaved; chicken pancreas; average and range			{ .0034 .0029-. 0042	.051		
Porter; Texas market; 4	do			{ .0155 .0112-. 0184	.215		
Pritchard; Texas A. and M. College Farm; 2	do			{ .0043 .0041-. 0044	.074		
Rutgers; Texas A. and M. College Farm; 2	Buffered; autoclaved; chicken pancreas; average			.0038	.064		
Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range			{ .0011 .0010-. 0012	.018		114
Beefsteak; Texas A. and M. College Farm; 2	do			{ .0029 .0026-. 0031	.018		
Bonny Best; Texas A. and M. College Farm; 2	do			{ .0055 .0053-. 0057	.083		
Earliana; Texas A. and M. College Farm; 6	do			{ .0017 .0011-. 0021	.028		
Marglobe; Texas A. and M. College Farm; 4	do			{ .0028 .0025-. 0029	.044		
Pan American; Texas A. and M. College Farm; 2	do			{ .0063 .0045-. 0080	.096		
Porter; Texas market; 4	do			{ .0113 .0091-. 0134	.166		
Pritchard; Texas A. and M. College Farm; 2	do			{ .0037 .0033-. 0041	.056		
Rutgers; Texas A. and M. College Farm; 2	do			{ .0066 .0050-. 0081	.100		
Solid and liquid; 10 samples, 60 cans	Buffered; heated 45 minutes (abstract); chemical method.						.112
Takadiastase; average and range	{ .0027 .0015-. 0041			{ .0054 .0039-. 0082			59
Drained solids; 12 cans	Hog pancreas			.0006			89

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

¹ mg. per 100 ml.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both			
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Turkey: Raw-----	Crosscut steaks; Virginia: 1----- 2 <i>S. faecalis</i> , 3 <i>L. casei</i> -----	Buffered; autoclaved----- Buffered; autoclaved; chicken pancreas; average and range.	.0039 .0046 .0045-.0047	.013	.0035 .0034 .0032-.0035	.010				
	Crosscut steaks; Virginia: 2----- 3-----	Buffered; autoclaved; average and range Buffered; autoclaved; chicken pancreas; average and range.	.0123 .0121-.0125 .0143 .0141-.0149		.0083 .0070-.0095 .0101 .0100-.0105				114	
	Steaks, light meat; Virginia: 1----- 2-----	Buffered; autoclaved----- Buffered; autoclaved; chicken pancreas; average.	.0052 .0059	.021	.0039 .0044	.015				
	Texas market; 2-----	Buffered; autoclaved; chicken pancreas; average and range.			.0103 .0101-.0105	.040				
Turnip: Raw-----	1 sample, 7 specimens-----	Takadiastase-papain; 40,000----- [200,000]-----	.026 [.0052]	.33 [.066]					25	
	1 sample-----	Takadiastase-papain; 40,000----- [200,000]-----	.114 [.0228]						26	
	1 sample-----	Takadiastase-papain; 40,000----- [200,000]-----	.050 [.010]							
	Washington, D. C., market: 1----- 2 <i>S. faecalis</i> , 3 <i>L. casei</i> -----	Buffered; autoclaved----- Buffered; autoclaved; chicken pancreas; average and range.	.0020 .0047 .0045-.0049		.0039 .044					
Turnip greens: Raw-----	Washington, D. C., market-----	Buffered; autoclaved; chicken pancreas-----	.00381		.00332					
	Immature; Maryland farm: 1----- 2-----	Buffered; autoclaved----- Buffered; autoclaved; chicken pancreas; average and range.	.0094 .0422 .0408-.0436		.0102 .0255 .464					
	Mature; Washington, D. C., market: 2----- 4-----	Buffered; autoclaved; average and range Buffered; autoclaved; chicken pancreas; average and range.	.0343 .0336-.0350 .0636 .0440-.0845 .0472		.0439 .0430-.0447 .0695 .0534-.0826 .0529				114	
	Washington, D. C., market----- Texas A. and M. College Farm; 2----- do-----	Buffered; autoclaved; chicken pancreas; average and range.			.927					
		Buffered; autoclaved; chicken pancreas; average and range.			.948	.878				
		do-----			.0939-.0956 .0867	.1.097				
					.0828-.0905					

Dehydrated	1949 A.O.A.C. collaborative assay.	Buffered; autoclaved; chicken pancreas; specified method; average and range. Buffered; autoclaved; chicken pancreas or other treatment; other than specified method; average and range. Chick growth method; 1 laboratory Chick blood method; 1 laboratory	.593 .404-.81 .529 .143-.674	.6206 .425-.788 .627 .42-.83					45
Veal:		Special sample; 2		.645		.667			114
Chop	1 sample, 6 specimens	Takadiastase-papain; 40,000 [200,000]	.092 [.0184]	.29 [.058]					25
	All visible fat removed; 1 sample, 3 specimens.	Takadiastase-papain; 40,000 [200,000]	.17 [.034]	.61 [.122]					
Flank		Takadiastase	.031		.022				
Heart		do	.014		.013				
Kidney		do	.021		.016				
Leg		do	.013						
		do	.012						
Liver		do	.031		.045				
		do	.036		.047				
		do	.025		.018				
		do	.029						
		do	.033		.018				103
		do	.021		.013				
Shoulder		do	.040		.051				
		do	.052		.051				
		do	.039		.048				
		do	.039		.048				
Stew meat	Washington, D. C., market: 2	Buffered; autoclaved; average and range	.0025 .0017-.0032		.0033 .0029-.0036				
	3	Buffered; autoclaved; chicken pancreas; average and range.	.0050 .0041-.0069	.018	.0043 .0031-.0064	.015			114
Walnut	Washington, D. C., market	Buffered; autoclaved; chicken pancreas	.00396		.00268				
	Washington, D. C., market; 5	Buffered; autoclaved; chicken pancreas; average and range.	.0782 .0693-.0883	.081	.0761 .0725-.0800	.079			
Water cress:		Takadiastase	.049	.502					50
Raw	Crezón (Berro) (<i>Nasturtium aquaticum</i> L.).								
	Texas market; 2	Buffered; autoclaved; chicken pancreas; average and range.			.0476 .0433-.0519	.898			114
Watermelon	1 sample, 1 specimen	Takadiastase-papain; 40,000 [200,000]	.15 [.03]	1.5 [.3]					25
		Buffered; heated 45 minutes (abstract); chemical method.						.09	8
		Buffered; autoclaved; average and range	.0003 .0002-.0005		.0004 .0001-.0005				
	Washington, D. C., market: 3 <i>S. faecalis</i> , 4 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	.0007 .0006-.0008	.008	.0007 .0005-.0008	.008			114
	5	do			.0003 .0002-.0004	.003			
	Black Diamond; Texas A. and M. College Farm; 3.								

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—*Compiled data on the folic acid content of foods—Continued*

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Watermelon—	Continued Yellow Desert King; Texas A. and M. College Farm; 2.	Buffered; autoclaved; chicken pancreas; average and range—Continued. Takadiastase or other enzyme (ab- stract); chemical method.			.0006 .0005-.0006	.007			114	
Whale liver								4.68	8	
Wheat and wheat products: Whole grain		Takadiastase-papain; 3, 100 [200, 000]		2.80 [.0434]					20	
	Whole wheat; 1 sample, 1 pound.	Takadiastase-papain; 40, 000 [200, 000]	.19 [.038]	.20 [.04]					25	
	Whole wheat; 4 assays	Takadiastase; 40, 000; range [200, 000]	.05-.13 [.01-.026]						85	
		Takadiastase; rat liver; 40, 000; range [200, 000]	.10-.17 [.02-.034]							
	1 sample	No treatment.....	.030		.043					
		pH 4 autoclaved 12 hours.....	.022		.024					
		0.1 N KOH; autoclaved 1 hour.....	.010		.020				76	
		2 N KOH; autoclaved 30 minutes.....	.010		.020					
		Takadiastase.....	.055		.090					
		Chicken pancreas.....	.020		.042					
		Buffered; heated 45 minutes (abstract); chemical method.	.60					.80	8	
	2 samples	Hog kidney.....	Trace						61	
	Trigo P. C. Son (<i>Triticum vulgare</i> L.).	Takadiastase.....	.061	.067						
	Trigo C (<i>Triticum vulgare</i> L.).	do.....	.037	.041					50	
	Feedstuff; 3 tests	Chick growth method; average and range								
	Feedstuff; 6 samples	Buffered; autoclaved; hog kidney; aver- age and range.	.062 .053-.068		.055 .047-.060				75	
	1948 crop; composite U. S. sam- ple: Durum:									
	1 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	.0302		.0135 .0134-.0135					
	7	Buffered; autoclaved; chicken pancreas; average and range.	.0504 .0350-.0633	.056	.0270 .0165-.0356	.030				
	Hard red spring:									
	1 <i>S. faecalis</i> , 2 <i>L. casei</i>	Buffered; autoclaved; average and range	.0306		.0144 .0130-.0157					
	7	Buffered; autoclaved; chicken pancreas; average and range.	.0511 .0368-.0650	.056	.0408 .0273-.0530	.045				

	Hard red winter:							
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0142 .0127-.0157		.0088 .0063-.0102			
	7 <i>S. faecalis</i> , 6 <i>L. casei</i>	Buffered; autoclaved; chicken pancreas; average and range.	{ .0897 .0350-.0443	.044	.0356 .0295-.0447	.040		
	Red durum:							
	2.....	Buffered; autoclaved; average and range	{ .0266 .0182-.0350		.0183 .0085-.0281			
	6.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0526 .0462-.0603	.057	.0314 .0267-.0370	.034		
	Soft red winter:							
	2 <i>S. faecalis</i> , 3 <i>L. casei</i>	Buffered; autoclaved; average and range	{ .0169 .0164-.0173		.0079 .0045-.0109			
	7.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0493 .0256-.0810	.055	.0306 .0245-.0335	.034		
	White:							
	2.....	Buffered; autoclaved; average and range	{ .0145 .0143-.0146		.0071 .0062-.0079			
	7.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0434 .0369-.0493	.049	.0379 .0340-.0420	.042		
Flour.....	White, unenriched; 1 sample, 1 pound.	Takadiastase-papain; 40,000 [200,000].....	{ .067 [.0134]	.075 [.015]				25
	Whole wheat.....	Takadiastase-papain; method a, turbidimetric.			.032			
		Takadiastase-papain; method a, aci-dimetric.			.035			
		Takadiastase-papain; method b, aci-dimetric			.033			
		Takadiastase-papain; method a, turbidimetric.			.031			100
	White.....	Takadiastase-papain; method a, aci-dimetric.			.035			
		Takadiastase-papain; method b, aci-dimetric.			.035			
	Whole wheat; 2.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .0410 .0393-.0428	.046	.0360 .0350-.0370	.040		
	White, enriched, all-purpose; 4.....	do.....	{ .0095 .0092-.0098	.011	.0067 .0061-.0080	.007		
	do.....	do.....	{ .0083 .0041-.0103	.009	.0057 .0031-.0075	.006		
	White, enriched, all-purpose; 5.....	do.....	{ .0102 .0095-.0117	.011	.0081 .0074-.0095	.009		114
	<i>S. faecalis</i> , 4 <i>L. casei</i>							
	Cake, unenriched; 4.....	do.....	{ .0082 .0071-.0096	.009	.0050 .0041-.0058	.005		
	Gluten; 6.....	do.....	{ .0416 .0377-.0468	.044	.0270 .0238-.0297	.028		
Breakfast cereal.....	Bran, probably half whole wheat; 5 samples.	Buffered; autoclaved; hog kidney; average and range.	{ .081 .051-.107		.077 .051-.096			41
	Bran; Washington, D. C., market:							
	2.....	Buffered; autoclaved; average and range	{ .0466 .0385-.0546		.0242 .0225-.0258			
	3.....	Buffered; autoclaved; chicken pancreas; average and range.	{ .1208 .1058-.1508	.126	.0796 .0733-.0836	.083		114

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis (7a)		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)			
Wheat and wheat products —Continued .										
Breakfast cereal—Co ntinued										
Farina; Washington, D. C., market; 2 <i>S. faecalis</i> , 3 <i>L. casei</i> .		Buffered; autoclaved; average and range	{ .0071 .0056-.0085		.0052 .0042-.0065					
Flakes; Washington, D. C., market:		Buffered; autoclaved; chicken pancreas; average and range.	{ .0143 .0113-.0169	.016 -----	.0129 .0073-.0182	.014 -----				
2-----		Buffered; autoclaved; average and range	{ .0124 .0120-.0128		.0097 .0096-.0098					
4-----		Buffered; autoclaved; chicken pancreas; average and range.	{ .0290 .0235-.0375	.030 -----	.0178 .0160-.0195	.018 -----				
Shredded Brand I; Washington, D. C., market: 1 <i>S. faecalis</i> , 2 <i>L. casei</i> -----		Buffered; autoclaved; average and range	.0107		{ .0083 .0082-.0083				114	
2 <i>S. faecalis</i> , 3 <i>L. casei</i> -----		Buffered; autoclaved; chicken pancreas; average and range.	.0383	.041	{ .0292 .0272-.0310	.032				
Shredded Brand II; Washing- ton, D. C., market: 2-----		Buffered; autoclaved; average and range	{ .0285 .0184-.0385		.0227 .0103-.0351					
4-----		Buffered; autoclaved; chicken pancreas; average and range.	{ .0868 .0468-.1369	.091	.0716 .0451-.1099	.075				
Wheat; 1 sample-----		Buffered; autoclaved; takadiastase-----	.029						90	
do-----		do-----	.046							
do-----		do-----	.019							
Whole wheat; 18 samples-----		Buffered; autoclaved; hog kidney; aver- age and range.	{ .039 .021-.050		.040 .021-.059				41	
Wheat, barley, and other prod- ucts: 2 <i>S. faecalis</i> , 3 <i>L. casei</i> -----		Buffered; autoclaved; average and range	{ .0310 .0244-.0376		.0240 .0140-.0300					
5-----		Buffered; autoclaved; chicken pancreas; average and range.	{ .0522 .0406-.0646	.054	.0330 .0235-.0422	.034				
Wheat and other products (in- fant food): 2 <i>S. faecalis</i> , 1 <i>L. casei</i> -----		Buffered; autoclaved; average and range	{ .0346 .0245-.0446		.0368				114	

	4	Buffered; autoclaved; chicken pancreas; average and range.	.0712 .0607-.0821	.074	.0608 .0526-.0690	.063			
Bran.....	Feedstuff; 5 tests	Chick growth method; average and range.							{ .21 .11-.35
	Feedstuff; 1 <i>S. faecalis</i> , 3 <i>L. casei</i> samples.	Buffered; autoclaved; hog kidney; average and range.	.235		{ .155 .153-.158				75
Germ.....	1 sample, 1 pound	Takadiastase-papain; 40,000 [200,000]	1.1 [.22]	1.2 [.24]					41
		Buffered; heated 3 minutes; hog kidney; method a.	.33						25
		Buffered; heated 3 minutes; hog kidney; method b.							91
		Buffered; autoclaved; hog kidney	.330		.280				41
Middlings....	Feedstuff; 1 sample								6
	Heated moderately								
	Feedstuff; 1 <i>S. faecalis</i> , 2 <i>L. casei</i> samples.	Buffered; autoclaved; hog kidney; average and range.	.176		{ .138 .128-.148				41
	Feedstuff; 3 tests	Chick growth method; average and range.							75
Sprouted, de-hydrated ..	Seed, shoot, and root	Takadiastase-papain; 3,100 [200,000]		10.6 [.164]					20
Whey:									
Fluid.....		Autolysis; 40,000 [200,000]		.003 [.0006]					130
Dried.....	Feedstuff; 3 tests	Chick growth method; average and range.							{ .09 .04-.18
Yam:									
Raw.....	Ñame, white (<i>Dioscorea alata</i> L.).	Buffered; autoclaved; takadiastase; chicken pancreas.		0					
Yautia Malanga:									
Raw.....	Taro, white (<i>Xanthosoma sagittifolium</i> Schott).	do		0					10
Yeast:									
Baker's.....	Fleischmann	No treatment	.047		.070				
		Autolysis	.23						
		pH 4 autoclaved 12 hours	.68		.76				
		0.1 N KOH autoclaved 1 hour	<.04		.10				
		2 N KOH autoclaved 30 minutes	.46		.59				
		Takadiastase	.06		.09				
		Chicken pancreas	.14		.14				
	Race 7; 18, 5/VI 1946 (dried)	Acid hydrolysis	.44		.55				
		Hog kidney	1.66		1.31				
	Race 7; 19, 18/VI 1946 (dried)	Acid hydrolysis	.30		.84				
		Hog kidney	1.52		1.30				
	Fleischmann (dried)	Acid hydrolysis	.28		.68				
		Hog kidney	1.42		.9				
	Race 7; 9, 21/IV 1946; commercial sample I.	do		1.54		1.3			65
	Race 7; 19a, 18/VI 1946; commercial sample II.	do		1.9		1.6			
	Omsk factory; 9, 21/IV 1946	do		.88		1.0			
	Fleischmann; 9, 21/IV 1946; sample I.	do		2.0		.9			
	Fleischmann; 19a, 18/VI 1946; sample II.	do		1.44					
	Fleischmann, 5 tests	Chick growth method; average and range						{ 4.11 1.50-7.00	75

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

TABLE 10.—Compiled data on the folic acid content of foods—Continued

Item (1)	Description of sample* (2)	Preliminary treatment of sample; method; potency designation of impure standard (in italics) (3)	Folic acid (mg./100 gm.)						Reference No. (8)	
			Microbiological assays				Other assays			
			<i>S. faecalis</i>		<i>L. casei</i>		<i>S. faecalis</i> or <i>L. casei</i> or both	Moist basis		
			Moist basis (4a)	Moisture- free basis (4b)	Moist basis (5a)	Moisture- free basis (5b)	Moist basis (6a)	Moist basis (7a)		
Yeast—Con. Baker's—Co-	ntinued	Takadiastase or other enzyme (abstract); chemical method.	1.38						1.55	
Brewer's		Takadiastase-papain; <i>40,000</i> [200,000]		.105 [.021]					127	
		Takadiastase; <i>40,000</i> [200,000]	.42 [.084]						117	
Anheuser-Busch Strain C:		Control; average and range								
3 samples		pH 3 autoclaved 4 hours						{ .028		
		2 N KOH autoclaved 1 hour						{ .018-.034		
2 samples		pH 4.5 autolysis						.52, .83	18	
do		Takadiastase						.36, .60		
1 sample		No treatment	.025		.033			.54		
do		pH 4 autoclaved 12 hours	.35		.87			.58		
Anheuser-Busch		0.1 N KOH autoclaved 1 hour			.6				76	
		Chicken pancreas	.62		.66					
		Takadiastase	.23							
		Untreated	.22							
Nondebittered		Chicken pancreas	.90							
		Hog kidney	1.32							
		Chicken pancreas; hog kidney	1.90							
Debittered		Untreated	.13						107	
		Chicken pancreas	.90							
		Hog kidney	1.32							
		Chicken pancreas; hog kidney	2.20							
Third generation; 16, 27/V 1946 (dried).		Acid hydrolysis	.00		.43					
Third generation; 18, 5/VI 1946 (dried).		Hog kidney	.55		.72					
Third generation; 19, 18/VI 1946 (dried).		Acid hydrolysis	.1		.24					
Fresh first generation; 17-18, 5/VI-15/VI.		Hog kidney	.75		.72					
Third generation		Acid hydrolysis	.30		.18					
Ninth generation		Hog kidney	.75		.62					
1948 A.O.A.C. collaborative as- say.		do		.90		1.16			44	
		do		.55		.63				
		do		.73		.27				
		Buffered; autoclaved; chicken pancreas; specified method; average and range.	2.018 1.147-2.44		1.869 1.501-2.450					
		Buffered; autoclaved; chicken pancreas or hog kidney; other than specified method; average and range.	2.181 1.330-3.02		2.148 1.536-3.024					

	1949 A.O.A.C. collaborative report; 1 laboratory.	Buffered; autoclaved; chicken pancreas Buffered; autoclaved; hog kidney Buffered; autoclaved; chicken pancreas; hog kidney. Chick growth method; average and range.				1.63 .17 1.68			45
	A-B Strain G; 10 tests	Hog kidney; average	3.55					{ 4.92 (1.76-8.00)	75
	10 samples	Takadiastase; rat liver				[2.1]			61
	Flaked	Buffered; autoclaved; chicken pancreas; average.	2.180		1.965				49
	Special sample; 2	Buffered; autoclaved.. Buffered; autoclaved; hog kidney.. Buffered; autoclaved; chicken pancreas..	.159 1.55 2.09						114
Dried	Experimentally produced: <i>Saccharomyces cerevisiae</i> No. 53; 4 samples.	Takadiastase; range				1.91-2.16			
	<i>Torulopsis utilis</i> No. 3; 4 samples.	do				1.06-1.52			4
	<i>Candida arborea</i> ; 4 samples	do				1.48-1.76			
	<i>Oidium lactis</i> A; 4 samples	do				.56-.78			
	<i>Saccharomyces cerevisiae</i> No. 53; 3 samples.	do				3.36-3.56			
	<i>Torulopsis utilis</i> No. 3; 3 samples.	do				.96-1.46			104
	<i>Candida arborea</i> ; 3 samples	do				1.15-1.96			
	<i>Oidium lactis</i> A; 3 samples	do				1.20-1.48			
	Sample No. 4	Untreated Chicken pancreas Hog kidney Chicken pancreas; hog kidney Hog kidney	.20 1.50 1.53 1.60 1.70						107
	Feedstuff; <i>Manilia murmanica</i> 8, 19/IV 1946; sample I.	do		1.80		1.34			
	Feedstuff, <i>Manilia murmanica</i> 21, 19/VI 1946; sample II.								
	<i>Manilia murmanica</i>	No enzyme Hog kidney pH 7 Hog kidney pH 5 No enzyme Chicken pancreas pH 7 Chicken pancreas pH 5 Buffered; autoclaved Buffered; autoclaved; hog kidney Buffered; autoclaved	.12 .65 1.41 .15 .19 .18 .. .041 .96 .84		Trace .76 1.34 .015-.02 .32 .32 .13 .88				65
	do	Rat-growth method							91
	<i>Torula</i>						1.00		11

* Numerals used in column 2 for Reference No. 114 refer to the number of subsamples per lot or to the number of determinations of special samples.

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